22500121178

PROCEEDINGS

OF THE

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

SESSION OF 1896.

EDITED BY THE PUBLICATION COMMITTEE.

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ITHACA, NEW YORK.

PHILADELPHIA:

PRINTED FOR THE ASSOCIATION.

1896.

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T. Bent. Cotton (V.S., Ont. V.C., 1882), Mount Vernon, Ohio.
Vouchers, H. D. Gill and Joseph Hughes.

William H. Gribble (D.V.S., A.V.C., 1883), Washington Court-House, Ohio.
Vouchers, E. H. Shepard and T. Bent. Cotton.

Charles H. Higgins (B.S., D.V.S., McGill University, 1896), Port Antonio, Jamaica.
Vouchers, D. McEachran and John M. Parker.

W. J. Hinman (V.S., Ont. V.C., 1876), Winnipeg, Manitoba.
Vouchers, J. Hawkins and M. Stalker.

F. W. Hopkins (D.V.S., A.V.C., 1886), Kansas City, Missouri.
Voucher, S. Stewart.

William Henry Kelly (V.S., N.Y. C.V.S., 1889), 195 Western Ave., Albany, N. Y.
Vouchers, C. D. Morris and N. P. Hinkley.

James Law (M.R.C.V.S., F.R.C.V.S., 1861 and 1877), Ithaca, N. Y.
Vouchers, W. Horace Hoskins and W. L. Williams.

H. M. Manly (V.S., Ont.V.C., 1891), Miamisburg, Ohio.
Vouchers, T. Bent. Cotton and E. H. Shepard.

Frank H. Miller (V.S., Montreal V.C., 1887), 110 Church St., Burlington, Vt.
Vouchers, W. Horace Hoskins and N. P. Hinkley.

John P. O'Leary (M.D.V., Vet. Dept. Harvard, 1895), E. Buffalo, N. Y.
Vouchers, F. H. Osgood and T. B. Rayner.

E. L. Quitman (M.D.C., Chicago V.C., 1891), 531 Jackson Boulevard, Chicago, Ill.
Vouchers, A. H. Baker and Joseph Hughes.

W. C. Rayen (D.V.S., Chicago V.C., 1890), Nashville, Tenn.
Vouchers, W. Horace Hoskins and A. H. Baker.

William H. Ridge (V.M.D., Univ. of Pa., 1888), Trevose, Pa.
Voucher, W. Horace Hoskins.

E. P. Schaffter (V.S., Ont. V.C., 1888), Kansas City, Missouri.
Vouchers, S. Stewart and T. J. Turner.

E. H. Shepard (V.S., Ont. V.C., 1888), 793 Doan St., Cleveland, Ohio.
Voucher, J. M. Wright.

S. B. Staples (D.V.S., A.V.C., 1893), Baton Rouge, La.
Voucher, W. H. Dalrymple.

S. J. Thompson (V.S., Ont. V.C., 1872), Carberry, Manitoba.
Voucher, J. W. Hawkins.

Herman Wellner (D.V.S., Royal Saxon Col., Dresden, Germany, 1888), 91 South St., Providence, R. I.
Vouchers, J. A. McLaughlin and F. H. Osgood.

H. S. Wende (V.S., Ont. V.C., 1886), Tonawanda, N. Y.
Vouchers, C. D. Morris and John Wende.

A. S. Wheeler (V.M.D., Univ. of Pa., 1891), 2532 Chestnut St., New Orleans, La.
Voucher, W. H. Dalrymple.

W. E. Wight (V.S., Ont. V.C., 1883), Delaware, Ohio.
Vouchers, J. M. Wright and T. Bent. Cotton.

F. A. Zucker (D.V.S., A.V.C., 1896), 256 Morris Ave., Elizabeth, N. J.
Vouchers, A. T. Peters and F. H. Osgood.

MEMBERS-ELECT WHO HAVE PARTLY QUALIFIED.

Adamson, John H., 716 13th St., N. W. Washington, D. C.
Burkholder, A. J., Staunton, Virginia.
George, J. O., 6 S. 5th St., Camden, N. J.
Hewitt, R. W., 15 Warren St., Bridgeton, N. J.
Kingery, S. H., Creston, Iowa.
Lloyd, Samuel E., Govanstown, Maryland.
Sharrard, E. H., Marysville, Kansas.

MEMBERS-ELECT WHO HAVE FAILED TO QUALIFY.

Bachman, B. F., Strasburg, Pa.
Dunphy, G. W. Quincy, Michigan.
Eliot, H. W., Ansonia, Connecticut.
Glasson, Samuel, Middletown, N. Y.
Fox, D. P., Sacramento, California.
French, A. H., Birmingham, Alabama.
Kelley, W. B., Patchogue, N. Y.
Lambert, H. D., Salem, Massachusetts.
McClelland, C. B., Lawrence, Kansas.
McLeod, E. J., 1149 Niagara St., Buffalo, N. Y.
Maclay, Thomas, Petaluma, California.
Robinson, L. A., 353 Forest Ave., Buffalo, N. Y.
Shipley, H., Sheldon, Iowa.
Shipley, L. U., Sheldon, Iowa.
Spencer, H. F., 224 E. St. John St., San Jose, California.
Willganz, C. J., 215 Carolina St., Buffalo, N. Y.

MEMBERS RESIGNED.

Armstrong, T. L., Indianapolis, Indiana.
Brownell, W. H., Brockton, Massachusetts.
Buckley, Thomas M., Brooklyn, N. Y.
Cowie, Charles, Ogdensburg, N. Y.
Fagan, Gulian C., New York City, N. Y.
Honan, J. H., Hammond, Indiana.
Johnston, Wyatt, Montreal, Canada.
Pope, G. W., Willimantic, Connecticut.
Pote, T. B., Terre Haute, Indiana.
Rose, Wm., Stapleton, N. Y.
Stuart, James, Beverly, N. J.

DROPPED FOR NON-PAYMENT OF DUES.

Ashe, Fred. W., Chicago, Illinois.
Attfield, William, 261 12th St., S. Brooklyn, N. Y.

Barnett, Otis, Edwardsville, Illinois.
Bates, Henry E., Waterbury, Connecticut.
Batten, E. C., 13 Burnett St., New York City, N. Y.
Bear, B. S. J., Mt. Joy, Pa.
Berkmeyer, W. H., 234 W. 42d St., New York City, N. Y.
Breed, C. S., cor. Tremont and Appleton Sts., Boston, Massachusetts.
Breeder, E. S., 135 Monroe St., New York City, N. Y.
Brown, J. E., Oskaloosa, Iowa.
Buckley, J. M., 434 Golden Gate Ave., San Francisco, California.
Buckley, L. E., 74 W. 52d St., New York City, N. Y.

Connelly, Ed., 450 W. 54th St., New York City, N. Y.
Crego, Porte, Aurora, Illinois.
Curry, W. W., Hackensack, N. J.

Darling, A., 1304 Washington St., St. Louis, Missouri.
Dean, G. G., Tully, N. J.
De Clyne, Theo., New Durham, N. J.
De Ronde, J. D., Nyack, N. Y.
Donnelly, J. T., Astoria, N. Y.
Dorian, F. P., 459 Nepperhan Ave., Yonkers, N. Y.
Dunn, R. A., 108 N. Pitt St., Alexandria, Virginia.

Eddy, H. L., 1308 20th St., N. Minneapolis, Minn.
Edwards, W. T., Downingtown, Pa.
Ernst, John, Leavenworth, Kansas.

Fair, J. D., Berlin, Ohio.
Faville, G. C., 46 Charlotte St., Norfolk, Virginia.
Fitzgerald, J. D., 1528 Howard St., San Francisco, California.

Gilbert, E. G., Pottstown, Pa.
Gilbank, F. G., 439 6th St., Detroit, Michigan.

Hassall, A., 1115 Carrollton Ave., Baltimore, Maryland.
Hawk, J. W., 10 Market St., Newark, N. J.
Hill, A. G., 110 Putnam St., E. Boston, Massachusetts.
Hollingsworth, C. E., La Salle, Illinois.
Hoover, Lee, Richmond, Indiana.
Howe, W. R., Dayton, Ohio.
Huntington, F. W., Woodford, Maine.

Jarman, G. A., Chestertown, Maryland.
Johnstone, James, 134 Chambers St., Newburg, N. Y.

Kennedy, J. T., West Union, Iowa.
Keys, A. A., 619 1st Ave., Minneapolis, Minnesota.
Krowl, I. N., Jeffersonville, N. Y.

Lanigon, O. J., Streator, Illinois.
Letts, R. R., 34 Newark St., Hoboken, N. J.
Loblein, E. L., New Brunswick, N. J.

McCapes, D. B., Vermillion, S. Dak.
Mahoney, F. X., 50 Village St., Boston, Massachusetts.
Miller, W. T., Indiana, Pa.
Moyer, O. R., Mt. Carroll, Illinois.
Myers, J. A., Harrisonburg, Virginia.

Neif, F. A., 1342 Brush St., San Francisco, California.
Newman, Philip, 292 Hayward St., Brooklyn, N. Y .
Nunan, William L., Lansdowne, Pa.

Osborne, E. M., East Hampton, L. I., N. Y.

Piatt, H. B., 3615 N. 9th St., St. Louis, Missouri.
Pierce, C. H., 24 Chardon St., Boston, Massachusetts.
Pomeroy, B. A., cor. 8th and Sibley Sts., St. Paul, Minnesota.
Purcell, C. H., Biddeford, Maine.

Ramsey, A. E., Louisiana, Missouri.
Robinson, W. H., 63 Jaques St., Somerville, Massachusetts.
Rose, A. H., South Acton, Massachusetts.
Rowland, H. W., 169 Halsey St., Newark, N.J.

Sander, E. L., 427 E. 57th St., New York City, N. Y.
Seale, J. H., Amesbury, Massachusetts.
Sellers, A. T., 444 Benson St., Camden, N. J.
Smith, S. S., Mitchell, S. Dak.
Stanwood, R. E., Freehold, N. J.
Stockwell, G. A., care Parke, Davis & Co., Detroit, Michigan.

Thompson, A. J., Terre Haute, Indiana.
Travers, Frank, Rhinebeck, N. Y.
Tuttle, A. A., New Briton, Connecticut.

Valerius, N. P., Watertown, Wisconsin.
Vander Roest, H., 315 Mulberry St., Newark, N. J.
Van Mater, G. C., 354 Macon St., Brooklyn, N. Y.

Walker, A. G., Taunton, Massachusetts.
Werntz, W. B., 4531 Lancaster Ave., Philadelphia, Pa.
Wittpenn, J. N., 310 Whiton St., Jersey City, N. J.

MINUTES OF THE PROCEEDINGS

OF THE

UNITED STATES VETERINARY MEDICAL ASSOCIATION

AT ITS THIRTY-THIRD ANNUAL MEETING,

HELD AT

BUFFALO, N. Y., SEPTEMBER, 1896.

First Day—*Tuesday, September* 1.

Morning Session.—The convention was called to order at 10 A.M. by President Hoskins, and Acting Mayor Adam Boeckel was introduced, who, on behalf of the city of Buffalo, extended a hearty welcome to the Society.

Dr. F. H. Osgood replied, on behalf of the Association, in a few well-chosen remarks.

A unanimous vote of thanks was tendered Mayor Boeckel, after which President Hoskins delivered his annual address.

The following members answered to roll-call by the Secretary: Drs. Ackerman, W. L. Baker, R. R. Bell, Brenton, Bretherton, Cary, Dalrymple, Dixon, William Dougherty, Gill, Hart, Hawkins, Hinkley, Hoskins, Howard, Hughes, Jakeman, Kilborne, J. P. Lowe, C. P. Lyman, R. P. Lyman, McDonough, Osgood, Pearson, Pendry, A. T. Peters, Pope, J. B. Rayner, T. B. Rayner, Reynolds, James Robertson, J. L. Robertson, Salmon, Stalker, Stewart, Sutterby, Trumbower, B. P. Wende, J. Wende, Willganz, W. L. Williams, Winchester, Wright.

Delegates present: Pennsylvania State Veterinary Medical Association—Drs. John C. Foelker, J. T. McAnulty. Ohio State Veterinary Medical Association—Drs. E. H. Shepard, W. E. Wight. Manitoba Veterinary Association—Drs. W. J. Hinman, S. J. Thompson. Horseshoers' National Protective Association—Drs. J. C. McKenzie, Rochester, N. Y.; J. T. McAnulty, Philadelphia, Pa.; James Robertson, Chicago, Ill.

Others of the profession present: New York State—Drs. F. A. Crandall, A. Crowforth, G. E. Gangloff, W. H. Kelly, C. J. Mulvey, J. A. McCrank, R. Perkins, E. Rafter, S. Somerville, Jr., M. D. Williams.

Pennsylvania—Dr. M. W. Drake, F. F. Hoffman, N. Rectenwald. Ohio—Drs. T. Bent. Cotton, H. M. Manley. Montana—Dr. M. E. Knowles. Tennessee—Dr. W. C. Rayen.

The following-named ladies were present at the opening session of the convention: Mrs. F. H. Osgood, Boston; Mrs. W. Horace Hoskins, Philadelphia; Mrs. Nelson P. Hinkley, Buffalo; Mrs. R. R. Bell, Brooklyn; Mrs. John R. Hart, Philadelphia; Mrs. Thomas B. Rayner, Philadelphia; Mrs. J. M. Wright, Chicago; Miss M. Woodburn, Philadelphia; Mrs. Wiliam Jakeman, Halifax.

The minutes of the Thirty-second Annual Meeting were read by the Secretary, approved, and ordered placed on file.

The minutes of the meeting of the Comitia Minora, held at the Genesee Hotel, on August 31, 1896, at 8.30 P.M.; also of the regular meeting of the Comitia Minora, held at the Genesee Hotel, on September 1, 1896, at 9 A.M., were read by the Secretary, as follows:

Report of the Comitia Minora.

A special meeting of the Comitia Minora was held in the Colonial Parlor of the Genesee Hotel, Buffalo, N. Y., on August 31, 1896, at 8 P.M., Chairman Williams presiding.

Members present: Drs. Hinkley, Hoskins, Howard, Osgood, Rayner, Stewart, Williams.

Members absent: Drs. Harrison, Lyford, Pearson, Robertson, Salmon, Turner.

The problem of collecting delinquent dues was first considered. On motion it was voted to recommend that the Secretary be instructed to place in the hands of a collecting agency the accounts of all delinquents who have not replied to letters and notices sent to them by the Secretary and where no sufficient reason for leniency is given.

Owing to lack of information in the case of alleged violation of the code by Dr. Berns, action was postponed.

The Secretary reported having notified Dr. Adair of complaint filed against him for violation of the code in using illuminated stationery, and had received a statement from Dr. Adair that he had ceased violating the code since receipt of the notice. On motion, Dr. Adair's statement was accepted and further action postponed.

It was moved and seconded to favorably recommend the resolution to amend the Constitution and By-Laws, offered during the last annual meeting by Dr. Lyman, to make Article IV. of the Constitution read: "A Board of Censors, to consist of seven members, shall be appointed by the President, to serve for one year. The several officers of the Association, with the Board of Censors, shall constitute the Executive Committee."

Moved by the Secretary, to amend the resolution by adding, "and the words Executive Committee" shall be substituted for the words "Comitia Minora," wherever used in the Constitution and By-Laws; seconded and carried.

The original motion to favorably recommend now prevailed.

The resolution offered by Dr. W. L. Williams to alter Chapter X., Article I., of the By-Laws by inserting "at such time as the Executive Committee may elect" instead of "on the first Tuesday in September," was then taken up, and a motion prevailed to unfavorably recommend.

Dr. Cary's resolution to add to Chapter VI., Article I., "A graduate of an agricultural college shall be admitted the second year in any three-year course veterinary college, provided said graduate has been required to take the following studies or their equivalents:

"Two or more years in practical and theoretical chemistry; six to nine months in elementary physiology, in botany, in zoology (including animal parasites), and in agriculture (including breeds of stock and stock breeding). One collegiate year of not less than five hours per week in theoretical and practical study of the veterinary sciences, under the direct supervision of a veterinarian who is a member of the U. S. V. M. A., or is eligible to membership," was carefully considered, and by unanimous vote unfavorably recommended.

A second resolution by Dr. Cary, to add as Article IX. to Chapter XI.: "All veterinary colleges making partial or entirely untrue statements or mystifying announcements may be called to account for the same in the same way or manner that a violator of the Code of Ethics is called to account for his violations. In case of conviction for untruthful or misleading advertising in catalogue, newspapers, journals or otherwise, said institution's graduates shall be debarred from admission to the U. S. V. M. A., and the institution shall be stricken from the list of recognized veterinary colleges," was unfavorably recommended. A majority of the committee held that this resolution involved points which the Association should not now undertake to pass upon.

The proposal by Dr. R. H. Harrison of the name of Dr. John Desmond, of Warnamboul, Australia, for honorary membership, was next considered It appearing from Veterinarian Desmond's correspondence that he was a solicitor for such honorary membership, and used such membership for personal prestige and gain, and it being the opinion that his contributions to veterinary science did not merit honorary membership, the proposal was unfavorably recommended.

Moved by Dr. Osgood, to recommend that papers sent to the Secretary to be read should lose their place on the programme and be read by title if there was not time to read in full. The motion prevailed.

Dr. Osgood, the committee appointed to investigate the application of Dr. C. A. Keene, laid over from last year, reported adversely, and a motion prevailed to unfavorably recommend.

The application of Dr. E. L. Quitman, laid over last year and referred to Dr. Williams as committee to investigate and report, was next considered. The committee found the applicant eligible. It was moved and carried to favorably recommend.

Dr. G. W. Vernon asked to withdraw his application, which had been laid over one year for investigation. A motion prevailed to recommend that the withdrawal be allowed.

The following applications for membership were considered and favorably recommended: Drs. Charles Higgins, F. W. Hopkins, W. H. Kelly, James Law, F. H. Miller, W. H. Ridge, W. C. Rayen, E. P. Schaffer, Herman Wellner, A. S. Wheeler.

The resignations of Drs. T. L. Armstrong, W. H. Brownell, Thomas M. Buckley, Charles Cowie, J. H. Honan, G. W. Pope, T. B. Pote, William Rose, J. A. Stuart, and Wyatt Johnson were considered, and a motion prevailed to recommend their acceptance.

The resignations of Drs. W. B. Kelley and J. Penniman were next presented by the Secretary with the statement that the dues were not paid. Moved and carried to recommend their acceptance on condition the dues are paid to date.

The resignation of Dr. S. K. Johnson was next taken up, and, on account of charges of violation of the Code of Ethics, its consideration was postponed for one year.

The resignation of Dr. J. A. Myers, whose dues were not paid and who says he will not pay, was duly considered, and a motion prevailed recommending expulsion.

An application from Dr. A. J. Burkholder for remission of arrears in dues on account of lack of notice of election to membership was postponed for further consideration.

A letter of grievance against the Bureau of Animal Industry by Dr. R. A. Archibald was laid over for further consideration.

A communication from Dr. D. E. Salmon, Chairman of the Pasteur Monument Committee of America, soliciting contributions to the Pasteur Monument Fund, was on motion referred to the Association.

Adjourned.

S. STEWART,
Secretary.

Regular meeting of Comitia Minora, held in Colonial Parlor of Genesee Hotel, Buffalo, N. Y., September 1, 1896, at 9 A.M.

Meeting called to order by Chairman Williams. Members present: Drs. Hinkley, Hoskins, Rayner, Robertson, Stewart, Williams. Mem-

bers absent: Drs. Harrison, Howard, Lyford, Osgood, Pearson, Turner, Salmon.

No urgent business presenting, it was moved and carried to adjourn.

S. STEWART,
Secretary.

On motion, the report of the Comitia Minora recommending that the proposed amendment by which the Comitia Minora could fix the date of annual meetings be not carried, was adopted.

The President: There was a recommendation that the Association should fix the time allowed by veterinary colleges to students coming from agricultural to veterinary colleges. Our Comitia Minora seemed of the opinion that while they can deal with individual applicants coming to us as the case may demand, it would not do to have the appearance of dictating to the schools.

Dr. Cary: I am of the opinion that the Comitia Minora entirely misunderstood it; it was not written with an idea of dictating to these colleges in any sense of the word. I know they would like to be recognized, and nearly every man here who has been connected with a veterinary or an agricultural college knows the value of an agricultural before taking a veterinary education, and it was only to stimulate this idea that I offered the amendment. As it stands at the present time, without any action upon this subject, we actually repudiate these colleges, which I think is a mistake.

Dr. Osgood: It is for the Faculty to decide what allowance they will make to agricultural students, and it is a matter that should come before the Association of Faculties rather than this Association. I think the resolution was more of a recommendation to encourage the veterinary colleges to take up this matter.

Dr. Cary: We state in the By-Laws that we require of these colleges so many years' study, of six months each, in order that their graduates may be accepted in this Association. If these graduates go on and assume these studies they are to be given one year's credit. Are you going to vote on this each year in each particular case? I do not see any better step to take in this direction. It does not bind the veterinary college to accept them; they may take an examination if they like. We do not say they "shall" do this; they "may."

Dr. Osgood: I do not think Dr Cary's point is well taken. We do not say a man must spend three years in a veterinary college; the Constitution says he shall be a graduate of a three-year school. In the State of Massachusetts they will allow a graduate from an agricultural college one year, providing he passes his examinations. They do not ask the candidate whether he has spent one, two, or three years. If he holds a diploma of the Harvard University he is eligible to membership,

unless there is some particular reason to inquire how he obtained that diploma.

Dr. Stalker: This point was raised by the Board of Medical Examiners in the State of Iowa. I was a member of the Board of Health for a number of years, and every practitioner must have a certificate from the Board of Medical Examiners, showing from what school he graduates, before he can be placed on the list of regular practitioners in our State. We pass on the validity of the colleges—as to whether they are colleges in good standing; but they never call into question what a particular student has passed through in order to obtain a diploma from that particular college. If we have a certificate presented from the Rush Medical College, or from your own university here, we simply accept it, and take it for granted that the gentlemen who had charge of and passed upon the qualifications of the student settled that question. So long as the college is in good standing its diploma is a guarantee of right to practice from that State; so long as the college is recognized in good standing we must give the gentlemen composing its Faculty the right to pass upon the qualifications of the student. Most of the institutions are only too ready to recognize the work done in agricultural colleges, and I doubt that we can make any dictation or hardly a suggestion in that direction.

On motion of Dr. Pendry, the recommendation of the Comitia Minora was adopted and the amendment defeated.

The recommendation of the Comitia Minora, that the application of Veterinarian Desmond, of Australia, for honorary membership be rejected for want of evidence of fitness for the honor, was adopted.

The President: A second amendment proposed by Dr. Cary was that "All veterinary colleges making partial or entirely untrue statements or mystifying announcements may be called to account for the same in the same way or manner that a violator of the Code of Ethics is called to account for his violations. In case of conviction for untruthful or misleading advertising in catalogue, newspapers, journals, or otherwise, said institution's graduate shall be debarred from admission to the U. S. V. M. A., and the institution shall be stricken from the list of recognized veterinary colleges." The Comitia Minora unfavorably recommend.

Dr. Dixon: It seems to me we have a perfect right to notify certain colleges that we do not approve of their methods, etc. I do not see why this resolution as it reads is not a good one.

The President: There would be great difficulty in drawing the line where such violation would come in. I think every member of the veterinary profession looks with a great deal of leniency upon the efforts of schools that are private in character and dependent upon its students; perhaps more leniency is shown them than is right. I do not think we should attempt to draw any lines in that manner, because we deal with

these institutions when their graduates come before us, and we decline to receive them in membership when we feel they are not carrying on their institutions in the proper manner.

Dr. Cary: Those of you who were here last year when I read the report of the Committee on Intelligence and Education will remember the reasons why this was introduced. Having been the chairman of that committee for two years, and having read a great many college catalogues, I found that in a great many instances mystifying statements—if not absolute untruths—were published in these college catalogues, and led young men to misunderstand them. I do not see wherein there is any risk for us. You will remember some personal illustrations I brought up last year. I suppose the simplest way would be to let the colleges do as they please about advertising, and let them do as they want to, whether it corresponds with their catalogues or not. There is a serious objection to this, however: the same objection in relation to the Code of Ethics as applied to the individual. There is just as much difficulty in one as in the other. I do not see why we permit an institution to do something we will not permit of the individual, and yet recognize that institution.

Dr. Williams: The Comitia Minora holds the opinion that the college is responsible to the profession for its acts. You cannot deal with the Faculty as a body in this Association, nor can we deal with the graduates emanating from an institution by refusing to admit them to our ranks simply because the Faculty is engaged in improper advertising; that has nothing to do with the candidate's qualifications for membership in this Association or to what extent he may be benefited by a membership in it.

Dr. Pendry: I think this Association has a perfect right to say what is honest and what is not; and either approve or disapprove of it.

Dr. Osgood: I think all will grant that this Association has no jurisdiction except over its members; there is no college in this country that has a membership in the Association; we simply have individual members. I do not think we have jurisdiction over the colleges.

Dr. Cary: You will notice in the resolution that it applies directly to the graduates of colleges. We say a college shall have a certain number of years' work; we have jurisdiction in that direction, and I do not see why we have not in regard to this matter. We are simply going to say to graduates of colleges that shall maliciously or falsely and intentionally misrepresent that institution—young men desiring an education—that your graduates shall not be recognized by us.

Dr. Dixon: You state here in one of the articles, in regard to a candidate for membership, that he shall be a graduate of a regularly organized veterinary school, etc., and whose corps of instructors shall contain at least four veterinarians, etc. If you lay down the law in regard to

what the character of the school shall be that the candidate comes from, why not do it in these other matters? On the other hand, when this man becomes a member of the Association, you say he shall not advertise by any illuminated cards or circulars, etc. We all know that one-half or more of the catalogues issued by the various schools are nothing more or less than picture-books; they show a man in his shirt-sleeves dissecting animals, etc.; and at the same time you prohibit a poor fellow from putting a horse's head on the corner of his card. In my opinion this amendment is directly in the line of our work, and I shall certainly vote in favor of it.

Dr. McDonough: We can say to the schools that we will refuse your students admission to this Association; we cannot refuse them admission until the schools apply for it, and I do not know of any instance where a college has applied for admission of students to this Association.

The President: The question is an important one, and carries with it a great deal of importance to the Comitia Mnora. It means that you shall ask us to draw the line where these schools shall advertise; to draw a line between the school which sets up as its greatest claim that of having its advertisements in every magazine in the country, and to pass the same before the student's eyes as before the vitascope; you ask us to pass upon schools claiming the longest period of time, irrespective of how much of that time is occupied in actual teaching; and ask us to pass on schools whose advertisements appear in the current periodicals in the country, over which you have no control. You are going to involve the Comitia Minora in a difficult matter to decide upon, and bring into it a question that will be a continuous source of contention from the time a resolution of that kind is adopted.

Dr. Pearson: If this proposed amendment were adopted I cannot see how it would affect the state of affairs as they now exist; any member of this Association has the privilege of introducing a resolution of censure at any time, if he sees anything in reference to schools that he thinks is wrong; he can write up a resolution, and it will go to the Comitia Minora and be referred back. I see no reason for including it in our Constitution. I think the penalty to be enforced in regard to the graduates from these schools would be most unjust. Because a man graduates from a school that advertises illegally after he has graduated is no reason why he should be prevented from joining this Association, or even if it advertises before he is a graduate. I move the report of the Comitia Minora be approved.

On motion, the report of the Comitia Minora recommending that the amendment do not pass, was adopted.

The proposed amendment to replace in the Constitution and By-Laws "Executive Committee" for "Comitia Minora" being favorably reported by the Comitia Minora, was on motion adopted.

The application of Dr. C. A. Keene for membership, deferred from 1895, was rejected, as recommended.

The application of Dr. E. L. Quitman for membership, deferred from 1895, and reported favorably, was accepted.

On motion, the veterinarians recommended for membership by the Comitia Minora were elected (*vide* report of Comitia Minora).

On motion, the resignations of those veterinarians favorably recommended by the Comitia Minora were accepted (*vide* report of Comitia Minora).

The President: Two members, Drs. J. Penniman and W. B. Kelly ask that their resignations be accepted; but the dues are not paid and the Board refuses to recommend the same.

The recommendation of the Comitia Minora that Dr. J. A. Myers be expelled for unprofessional conduct and failure to pay dues was, on motion of Dr. Dixon, rejected and referred back to that body.

The Secretary then read the following letter regarding a proposed Pasteur Memorial Fund:

WASHINGTON, D. C., August 12, 1896.

DR. S. STEWART, Secretary U. S. V. M. A.:

DEAR SIR: As a member of the Pasteur Monument Committee, I have been requested to correspond with the Veterinary Medical Association of the United States and secure its co-operation in collecting the contribution of this country to the Pasteur Memorial Fund. I enclose herewith a circular and return-envelope, and sincerely hope that you will bring the matter before your Association, and that your honorable body will contribute something as an evidence of its respect and appreciation of this great man who did so much for our profession.

With fraternal greetings, I am,

Very sincerely, yours,

D. E. SALMON,
Chairman.

[*Copy of Circular.*]

It has been decided to erect in one of the squares of Paris a monument to the memory of M. Pasteur. Statues or busts will also, no doubt, be located at his birthplace and in other cities. The Paris committee has, however, wisely determined that the statue obtained through international effort shall be located at Paris, where it will be seen by the greatest number of his countrymen and also by the greatest number of his admirers from other lands. The Paris committee has for honorary members the President of the Republic and his Cabinet, together with about one hundred and sixty of the most prominent officials, scientists, and other distinguished citizens of France. The active members of the committee are: J. Bertrand, President, member of the French Academy

Perpetual Secretary of the Academy of Sciences. J. Simon, Vice-President, member of the French Academy, Perpetual Secretary of the Academy of Moral and Political Science. Grancher, Secretary, member of the Academy of Medicine, Professor in the Faculty of Medicine. Bruardel, member of the Academy and of the Academy of Medicine, Dean of the Faculty of Medicine. A. Christophle, Honorary Governor of the Credit Foncier, Deputy from l'Orne. Count Delaborde, Perpetual Secretary of the Academy of Fine Arts. Duclaux, member of the Academy of Science and of the Academy of Medicine. Magnin, Governor of the Bank of France, Vice-President of the Senate. Baron A. de Rothschild, banker. Roux, Assistant Director of the Pasteur Institute. Wallon, Perpetual Secretary of the Academy of Inscriptions and Belles-Lettres.

The Paris committee has kindly extended the opportunity to the people of the United States to assist in this tribute of appreciation and love, and have authorized the organization of the Pasteur Monument Committee of the United States.

The members of this committee gladly accept the privilege of organizing the subscription and of receiving and transmitting the funds which are raised.

We believe it is unnecessary to urge anyone to subscribe. The contributions of Pasteur to science and to the cause of humanity were so extraordinary, and are so well known and so thoroughly appreciated in America, that our people only need the opportunity in order to demonstrate their deep interest.'

All can unite in honoring Pasteur. He was such an enthusiastic investigator, so simple, so modest, so lovable, and yet so earnest, so great, so successful; his ideals were so high and his efforts to ameliorate the condition of humanity were so untiring that we anticipate an enthusiastic response from the whole civilized world. The United States will vie with the foremost of nations in this tribute. Chemists, zoologists, physicians, and all others interested in science will wish to be represented. No one is expected to subscribe an amount so large that it will detract in the least from the pleasure of giving. A large number of small subscriptions, freely contributed and showing the popular appreciation of this eminent Frenchman, is what we most desire.

This committee supplies subscription blanks, which should be returned in the accompanying envelope, together with a money order, check, or draft covering the amount subscribed. All checks, etc., should be made payable to "Treasurer Pasteur Monument Committee," and when received by the secretary a numbered receipt will be forwarded to the sender. The original subscription papers will be forwarded to the Paris committee for preservation.

It is our purpose to do our work as largely as possible through societies or other organizations. We prefer to have each organization ap-

point one of its members as an associate member of this committee, with authorization to collect and forward the subscriptions. The amounts thus far subscribed by individuals vary from fifty (50) cents to ten (10) dollars. It is hoped that no one who is interested will hesitate to place his name upon the list because he cannot give the maximum amount.

Please let this receive your early attention and in that way assist our committee, which must conduct correspondence with societies of the entire country.

On motion of Dr. C. P. Lyman, consideration of the letter was deferred until later in the session.

The report of the Comitia Minora was then adopted in whole as amended.

Report of Committee on Army Legislation, J. P. Turner, chairman, was read by the Secretary, including report of Hon. J. P. Hull, of the Committee on Military Affairs. (See page 23.)

Dr. Hawkins: The Michigan State Association, at the last meeting, appointed a committee to wait on each member of Congress and bring the matter fully before him. I think if the other associations would take the same action there would be no doubt that the bill would pass.

Dr. Hart: It has been the desire of the committee that each State do as the gentleman has just stated. If each State association would interest itself and do as that State has done there will be no trouble with this bill.

Secretary Stewart: The Missouri State Veterinary Association last week passed resolutions in favor of the bill, and each member was requested to do all he could for it.

On motion of Dr. Trumbower, the report was received and the committee continued.

Meeting adjourned until 2 P.M.

Afternoon Session.

The meeting was called to order by President Hoskins. Mr. Samuel Cook, representing the Business Men's League of Columbus, Ohio, briefly addressed the Association, extending a hearty invitation to hold the next annual meeting in Columbus.

The President: In behalf of the Committee on Incorporation I desire to state that no active work had been done in the course of the past year, for two reasons: The treasury was bankrupt, and we had no funds to expend in endeavoring to procure this act of incorporation; and the second and more potent was that the President of the United States is not favorable to the granting of national acts of incorporation. He denied the National Association of Florists their incorporation after they had secured the passage of a bill through both Houses of Congress.

This carried with it the question of the adoption of a seal or emblem to be used by the members, which must be deferred until incorporation may be secured.

The report of the Committee on Finance was deferred until later in the session.

The Secretary then presented his report. (See page 29.)

On motion of Dr. Cary, the Secretary's report was received, spread upon the minutes, and a unanimous vote of thanks tendered.

Dr. Dalrymple, Resident State Secretary of the State of Louisiana, then presented his report. (See page 31.)

Dr. R. P. Lyman, State Secretary of Connecticut, then presented his report. (See page 35.)

Dr. Cary reported verbally that Alabama had a State association embracing all graduates in the State except one; a public abattoir and milk inspection laws at Montgomery, and a general freedom from contagious diseases of animals.

Dr. Pope, of New Hampshire, then presented his report. (See page 37.)

Dr. J. P. Lowe, of New Jersey, then presented his report. (See page 38.)

Dr. Clement, chairman of the Committee on Intelligence and Education, presented his report, which, after an extended discussion, was received. (See page 71.)

Dr. Williams, chairman of the Publication Committee, then presented his report. (See page 49.)

Dr. H. D. Gill read a paper entitled "The Relation of the Horseshoer to the Veterinarian," which was thoroughly discussed.

Drs. Pearson, Osgood, and Gill were appointed a Committee on Resolutions.

The meeting then adjourned to Wednesday, September 2, at 9 A.M.

SECOND DAY.—*Wednesday, September 2.*

Morning Session.—The convention was called to order at 9 A.M. by the President, and the following members were present: Drs. Ackerman, W. L. Baker, Barron, J. A. Bell, R. R. Bell, Brenton, Cary, Dalrymple, Dixon, William Dougherty, R. W. Ellis, Gill, Grange, Hart, Hawkins, Hinkley, Hoskins, Howard, Hughes, Huff, Jakeman, Kilborne, J. P. Lowe, C. P. Lyman, R. P. Lyman, McDonough, Morris, Osgood, Pearson, Pendry, A. T. Peters, Lemuel Pope, Jr., J. B. Rayner, T. B. Rayner, Reynolds, J. Robertson, J. L. Robertson, L. A. Robinson, Salmon, Stalker, Stewart, Sutterby, Trumbower, Weichsel, B. P. Wende, J. Wende, Willganz, Williams, Winchester, Wright.

New members present: Drs. Cotton, Hinman, Kelley, F. H. Miller, Rayen, Shepard, Thompson.

Delegates present: Drs. J. C. Foelker, J. T. McAnulty, N. Rectenwald, Pennsylvania State Veterinary Medical Association. Drs. W. H. Gribble, E. H. Shepard, W. E. Wight, Ohio State Veterinary Medical Association. Drs. W. J. Hinman, S. J. Thompson, Manitoba Veterinary Association. Drs. J. C. McKenzie, J. T. McAnulty, James Robertson, Horseshoers' National Protective Association.

Others of the profession present: New York State—Drs. N. L. Bell, L. L. Bishop, A. Crowforth, G. E. Gangloff, J. Gobin, D. A. Kennedy, J. A. McCrank, H. D. Martin, C. J. Mulvey, J. P. O'Leary, R. Perkins, F. A. Randolph, E. Rafter, A. G. Robinson, F. G. Shepard, S. Somerville, J. H. Taylor, H. S. Wende. New Jersey—Drs. L. G. Moore, F. A. Zucker. Pennsylvania—Drs. M. W. Drake, F. F. Hoffman. Ohio—Drs. E. H. Humphrey, H. M. Manley. Tennessee—Dr. R. E. Cotton. Canada—Drs. A. B. Campbell, J. W. Orr.

The report of the Comitia Minora was received, read, and adopted, as follows:

Report of Comitia Minora.

The regular meeting of the Comitia Minora was held in the Colonial Parlor of Genesee Hotel, Buffalo, N. Y., September 2, 1896, at 9 A.M., Chairman Williams presiding.

Members present: Drs. Hoskins, Howard, Osgood, Pearson, Rayner, Robertson, Salmon, Stewart, Williams.

Members absent: Drs. Harrison, Hinkley, Lyford, Turner.

Moved by Dr. Hoskins that consideration of delinquents be postponed until Thursday. Seconded and carried.

The applications for membership of Drs. T. Bent. Cotton, W. J. Hinman, E. H. Shepard, S. B. Staples, S. J. Thompson were presented by the Secretary. They were duly examined, and a motion prevailed to favorably recommend.

An application by F. A. Zucker was laid over for further consideration.

The grievance of Dr. R. A. Archibald was taken up and fully considered. It was found he had been dropped from service in the Bureau of Animal Industry at the termination of the period for which he had been appointed. Moved by Dr. Hoskins, seconded by Dr. Osgood, that upon investigation we find no cause for action. Carried.

Adjourned.

S. Stewart,
Secretary.

The President announced the election of officers as the next business before the meeting.

On motion of Dr. Pearson, the election of officers was deferred until after the discussion on "Tuberculosis."

The discussion on "Tuberculosis" was then opened by Dr. Pearson, and continued by other members until the hour of adjournment.

The following gentlemen were nominated for President: Dr. Clement by Dr. Pendry; Dr. Osgood by Dr. Salmon.

Dr. Osgood received 37 votes, Dr. Clement 8, and Dr. Osgood was declared elected.

The following gentlemen were nominated and elected as Vice-Presidents under closure of nominations and election by Secretary ballot: Drs. Roscoe R. Bell, M. R. Trumbower, M. Stalker.

The following gentlemen were nominated and elected respectively Secretary and Treasurer in like manner: Dr. S. Stewart, Secretary; Dr. James L. Robertson, Treasurer.

The Association adjourned at 1 P.M. until 10 A.M. of the following morning, the members accepting of the hospitality of the Buffalo veterinarians for the afternoon and evening. Meeting at the wharf, the members were ushered on board a pleasure boat and a run of several miles made down the Niagara River. On landing they were transferred to electric cars, which carried the party to Niagara Falls, thence through the gorge to Lewiston, where, after a short stop, the company started on its return, stopping at Niagara Falls to ascend the observation tower and take a hurried look at the falls. Proceeding thence to the boat landing, the party again embarked, to find an elegant dinner spread, of which all partook heartily, after which the various members enjoyed themselves in social recreation, dancing, etc., while music was furnished by an excellent band provided by the hosts. Several ladies, among whom were Mesdames Salmon, Wright, Rayner, Hoskins, Osgood, Hinkley, Somerville, Jakeman, Bell, Miss Rectenwald and Miss Woodburn, added greatly to the enjoyment of the trip by their presence, making altogether the most enjoyable entertainment ever accorded the Association.

THIRD DAY.—*Thursday, September* 3, 1896.

Morning Session.—The convention was called to order at 10 A.M. by the President.

On roll-call the following members were present: Drs. Ackerman, W. L. Baker, Barron, J. A. Bell, R. R. Bell, Berns, Brenton, Cary, Clement, Dalrymple, Dixon, William Dougherty, R. W. Ellis, Gill, Grange, Hart, Hawkins, Hinkley, Hoskins, Howard, Hughes, Huff, Jakeman, Kilborne, Knowles, J. P. Lowe, C. P. Lyman, R. P. Lyman, McLeod, Morris, Osgood, Pearson, Pendry, A. T. Peters, Pope, J. B. Rayner, T. B. Rayner, Reynolds, J. Robertson, J. L. Robertson, L. A. Robinson, Salmon, Stalker, Stewart, Sutterby, Trumbower, Weichsel, B. P. Wende, J. Wende, Willganz, Williams, Winchester, Wright.

New members present: Drs. Cotton, Gribble, Hinman, Kelly, Law, Manley, Miller, O'Leary, Rayen, Shepard, Thompson, S. H. Wende, Wright, Zucker.

Honorary members present: Professor D. McEachran, of Montreal, Canada.

Delegates present: Pennsylvania State Veterinary Medical Association—Drs. John C. Foelker, J. T. McAnulty, N. Rectenwald. Ohio State Veterinary Medical Association—Drs. W. H. Gribble, E. H. Shepard, W. E. Wight. Manitoba Veterinary Association—Drs. W. J. Hinman, S. J. Thompson. Horseshoers' National Protective Association—Drs. J. C. McKenzie, J. T. McAnulty, and James Robertson.

Others of the profession present: New York State—Drs. N. L. Bell, L. L. Bishop, J. S. V. Bowen, R. C. Bowman, A. F. Carpenter, T. T. Crandall, A. Crowforth, G. E. Gangloff, D. A. Kennedy, J. T. Liddle, J. A. McCrank, H. D. Martin, C. J. Mulvey, R. Perkins, E. Rafter, R. C. Shultz, S. Somerville, W. E. Stocking, J. P. Thompson, F. J. Thornberg, J. H. Taylor. New Jersey—Dr. L. G. Moore. Pennsylvania—Drs. M. W. Drake, F. F. Hoffman. Ohio—Dr. E. H. Humphrey. Tennessee—Dr. R. E. Cotton. Canada—Professor Andrew Smith, Drs. A. B. Campbell, Charles Elliott, William Gibbs, J. W. Orr.

Dr. Winchester presented a paper on "Diphtheria,"[1] which was freely discussed, and at the close of the discussion a committee consisting of Drs. Stalker, Gill, and Lyman was appointed to continue the subject at the meeting of 1897.

Dr. D. E. Salmon then presented a paper on "Avian Tuberculosis," which was heartily applauded and freely discussed.

The President then introduced Dr. Dalrymple, of Louisiana, who presented a paper on "Southern Veterinary Experiences," which was quite freely discussed.

The Committee on Resolutions offered the following:

Whereas, Tuberculosis of some of our domestic animals, and especially of cattle, is a widespread and destructive disease; and

Whereas, Statistics accumulated during the year past show that the disease is very prevalent throughout this country, especially in dairy herds, and indicate that it is steadily increasing, except in States where active measures for its suppression have been enforced; and

Whereas, There exists in some quarters a difference of opinion as to the relation of tuberculosis among cattle to the public health, notwithstanding the fact that this matter has been the object of careful scientific inquiry by a great number of eminent scientists in all parts of the world, and that reliable and uniform results and observations are recorded in great numbers in the veterinary and medical literature; be it

Resolved, That it is the opinion of the United States Veterinary Med-

[1] Dr. Winchester having caused his paper and the discussion thereon to be published under copyright, the Association is legally barred from printing it, and must refer the reader to the American Veterinary Review for October, 1896.

ical Association that the following points have been demonstrated beyond dispute and may be accepted as fully established:

1. That tuberculosis of man and cattle is identical.

2. That the milk from cows with tuberculous udders may cause tuberculosis in animals fed upon it.

3. That the milk from cows with extensive tuberculosis, but apparently healthy udders, may in some cases contain the germs of tuberculosis and cause the disease in animals fed upon it.

4. That in some cases the germs of tuberculosis appear in the milk of tuberculous cows that are not far advanced in the disease, and that have udders that are healthy, so far as can be determined by an examination made during the life of the animal.

5. Slightly tuberculous cows sometimes succumb to a sudden exacerbation of tuberculosis, and furnish virulent milk for a period before it is possible to discover their condition by means of a physical examination.

6. Tuberculin furnishes incomparably the best means of recognizing tuberculosis in the living animal.

7. Tuberculin, properly used for diagnostic purposes, is entirely harmless to healthy cattle, and is so exceedingly accurate in its effects that the few errors resulting from its use cannot affect the general results, and are of less frequent occurrence than following the use of any other method of diagnosing internal diseases.

8. That the carcasses of tuberculous animals may be and sometimes are dangerous to the consumer, and all such carcasses should be subjected to rigid inspection by a competent veterinarian, and those that are condemned should be disposed of in such a manner that it will be impossible to put them on the market for consumption as human food.

9. That the importance of dairy inspection cannot be overestimated, and municipal and health authorities should at once perfect a system commensurate with the vast importance of the subject.

Resolved, That the live-stock and especially the breeding interests of this country can never regain their former prosperity until such measures have been carried out by the national and State governments as will afford some reasonable guarantee against the continued ravages of this disease. And in view of the prevalence of bovine tuberculosis in foreign countries, and the measures taken by some of them to protect their cattle from further infection, the United States should prohibit the importation of breeding animals until they have been proven by the tuberculin test to be free from this disease.

Resolved, That the United States Veterinary Medical Association, assembled in annual convention at Buffalo, N. Y., September 3, 1896, hereby respectfully and most earnestly protests against the passage, by the Congress of the United States, of Senate Bill No. 1552, improperly

entitled "A bill for the further prevention of cruelty to animals in the District of Columbia," or of any other bill designed, like the said bill, to place restrictions upon scientific experiments upon living animals.

Resolved, That the said Association believes such legislation to be injurious to the progress of the biological sciences, and that where operative it will prevent the acquirement of medical knowledge essential for the prevention and cure of the diseases of animals and men, and desires to add its protest to the protests already made by the American Medical Association, the National Academy of Sciences, the Association of American Medical Colleges, the Association of American Physicians, the American Academy of Medicine, the Medical Society of the District of Columbia, the American Association for the Advancement of Science, the American Microscopical Society, and other medical and scientific societies of the United States.

Resolved, That the Secretary be directed to transmit a copy of these resolutions to the President of the Senate and the Speaker of the House of Representatives.

Resolved, That the United States Veterinary Medical Association appreciates the opportunity so courteously presented by the Pasteur Monument Committee of France to the American people of assisting in the erection of a suitable monument at Paris to the memory of the great investigator, and that the President is hereby authorized to appoint a committee to raise a fund which shall be presented in the name of the Association.

Whereas, The Thirty-third Annual Meeting of the United States Veterinary Medical Association in Buffalo has been so enjoyable and profitable as to mark the beginning of a new era in the history of our organization; and

Whereas, This gratifying state of affairs has resulted largely from the efforts of the energetic and hospitable local committees; be it

Resolved, That this Association tender to the local committees and those who have assisted them a vote of thanks to indicate its sincere appreciation of the reception it has been accorded in Buffalo, and recommends that the President appoint a committee to draw up suitable resolutions expressive of our appreciation, and that the same be engrossed in permanent form and presented to the Chairman of the Local Committee of Arrangements, and that a copy of the same be spread upon the minutes of this meeting.

Whereas, His Honor, Acting Mayor Boeckel, with all the numerous demands which have been made upon his time, has honored us by opening our convention and extending a cordial welcome and freedom of the city; be it

Resolved, That we, the members of the United States Veterinary Medical Association, recognizing these facts, and with a full appreciation of the same, extend to him a hearty vote of thanks.

L. Pearson,
F. S. Osgood,
H. D. Gill.

Carried unanimously.

Resolved, That this Association regrets extremely to hear of the death during the past year of a prominent member of the veterinary profession, John W. Gadsden, of Philadelphia, one who was for a considerable time a member of this Association, and who was universally beloved and respected by those of us who knew him best.

Be it further resolved, That these resolutions be spread upon the minutes of this Association under a suspension of rules governing the order of business, and that a copy of the same be sent to the widow of the deceased.

A. W. Clement,
L. H. Howard,
Roscoe R. Bell.

The resolutions were adopted as read.

The following resolution relating to horseshoeing was offered:

Resolved, That this Association approves the action of the Master Horseshoers' Association in reference to the instruction of its members and their subordinates on such subjects as tend to perfect the art of horseshoeing, and thus avoid the great and frequent losses that result from the imperfect shoeing of the horse's hoof; and this Association pledges its support to all properly directed measures designed to accomplish this object, and it is the sentiment of this Association that horseshoers should be instructed in such subjects as pertain to the normal form and function of the foot and the mechanical processes necessary to preserve such conditions.

Dr. Clement: It seems to me that the gist of this resolution is that it recommends that horseshoers should be instructed in the normal condition of the horse's hoof, and this is purely the art. There is a line drawn very distinctly between art and science; and the mechanical process necessary to preserve the foot, it seems to me, should be encouraged and recommended.

Dr. Knowles: The horseshoers are all friends of the veterinarian, and substantial friends; they do us a great deal more good than they do harm.

Dr. Hinman: I think it should be the object of this Association to encourage the horseshoers in every way. I can see no reason why a veterinarian should not wish to have his horseshoer the best in his art of shoeing. Coming from the North, where shoeing is done much more

often than it is in the South, especially in the winter, I think that instructions of this kind are beneficial. It may not be so necessary in large cities, where you have the best men.

Dr. Dixon: We ought to consider that shoeing horses is a handicraft, not a profession. Let these men perfect their handicraft; we should not attempt to discourage them. There is hardly a man in this room that can take up a hammer and direct how their work should be done, and what is the use of talking about encouraging them and instructing them in an art about which we know nothing.

On motion, the resolution was adopted as read.

Dr. Lyman: I ask for information only, but it struck me that in reading the resolution regarding tuberculosis and tuberculin that the statement was made that injection was not harmful to animals suffering from tuberculosis. I should like to understand more fully what that means.

The resolution was again read.

On motion, the convention took a recess until 2 P.M.

Afternoon Session.

The convention was called to order at 2 P.M. by the President.

Report of the Comitia Minora was read by the Secretary.

REPORT OF THE COMITIA MINORA.

The regular meeting of the Comitia Minoria was held in the Colonial Parlor of the Genesee Hotel, September 3, 1896, at 9 A.M., Chairman Williams presiding.

Members present: Drs. Hoskins, Howard, Osgood, Pearson, Salmon, Stewart, Williams.

Members absent: Drs. Harrison, Hinkley, Lyford, Robertson, Turner.

Applications for membership by Drs. O. G. Atherton, J. H. Pitcairn, and Dillard Ricketts, laid over from 1894, were taken up for consideration. The Secretary stated that the applicants had not been supplied with the revised Constitution and By-Laws; had not been notified that it was necessary to deposit the initiation fee; they were not acquainted with the present conditions for membership, and he did not believe they would all desire to become members under the present conditions. It was moved and carried not to recommend, as this action leaves them in the position to file new applications without prejudice.

The application of Dr. Anderson Crowforth was considered, and a motion prevailed to unfavorably recommend, for two reasons, viz., the applicant uses illuminated stationery, which conflicts with the Code of

Ethics, and he is guilty of plagiarism in presenting in an essay, as his own production, a part of Professor James Law's report on "Tuberculosis."

The applications of Drs. W. H. Gribble, H. M. Manley, J. P. O'Leary, H. S. Wende, and W. E. Wight were, on motion, favorably recommended.

Adjourned.

S. STEWART,
Secretary.

Special meeting of the Comitia Minora was held in Buffalo University, September 3, 1896, at 1 P.M.

Meeting was called to order by Chairman Williams.

Members present: Drs. Hinkley, Hoskins, Howard, Pearson, Osgood, Rayner, Robertson, Stewart, Williams.

Members absent: Drs. Harrison, Lyford, Salmon, Turner.

On motion, the action taken in the case of Dr. J. A. Myers was reconsidered. Upon presentation of the fact the former action was unusual if not unwarranted. It was moved and carried to recommend a reconsideration of the vote for expulsion, and instead thereof that he be dropped from the roll for non-payment of dues.

A motion prevailed to recommend the remission of the dues of Dr. S. E. Weber, on account of long-continued ill health and inability to pay.

The case long pending against Dr. George H. Berns was taken up for further consideration. Dr. Berns appeared before the Comitia Minora and stated that he had complied fully with all the requirements of the Code in the matter of advertising fomentation-pads. After a full investigation it was found that Dr. Berns had met the requirements of the code, and he was declared to be in good standing.

The application for membership of Dr. F. A. Zucker was taken up for further consideration, and upon a satisfactory showing by the Governing Faculty of the American Veterinary College that the length of its course of instruction met the requirements of Chapter VI. of the By-Laws, a motion prevailed to favorably recommend.

On motion, duly seconded and carried, it was recommended to drop the following members for non-payment of dues:

F. W. Ashe, W. A. Attfield, Otis Barnett, Henry Bates, E. C. Batton, B. S. J. Bear, William H. Berkmeyer, C. S. Breed, E. S. Breeder, J. E. Brown, J. M. Buckley, Leo E. Buckley, Ed. Connelly, Porte Crego, W. W. Curry, A. Darling, G. G. Dean, Theodore De Clyne, J. D. De Ronde, J. T. Donnelly, F. P. Dorian, R. A. Dunn, H. L. Eddy, W. T. Edwards, John Ernst, J. D. Fair, G. C. Faville, J. D. Fitzgerald, E. G. Gilbert, F. G. Gilbank, Albert Hassall, J. W. Hawk, A. G. Hill, C. E. Hollingsworth, Lee Hoover, W. R. Howe, F. W. Hunting-

ton, G. A. Jarman, James Johnstone, J. T. Kennedy, A. A. Keys, I. N. Krowl, O. J. Lanigon, R. R. Letts, E. L. Loblein, D. B. McCapes, F. X. Mahony, W. T. Miller, O. R. Moyer F. A. Neif, Phillip Newman, W. L. Nunan, E. M. Osborne, H. B. Piatt, B. D. Pierce, C. H. Pierce, B. A. Pomeroy, C. H. Purcell, A. E. Ramsey, W. H. Robinson, A. H. Rose, H. W. Rowland, E. L. Sanders, Fred. Saunders, J. H. Seale, A. T. Sellers, S. S. Smith, R. E. Stanwood, G. A. Stockwell, A. J. Thompson, F. Travers, A. A. Tuttle, N. P. Valerius, H. Vander Roest, G. C. Van Mater, A. G. Walker, W. B. Werntz, J. N Wittpenn.

Adjourned.

S. STEWART,
Secretary.

On motion the report was adopted as read.

Dr. A. T. Peters, of Nebraska, then presented a paper on "Serum Therapy in Hog Cholera," which was fully discussed.

Dr. M. H. Reynolds next presented a paper on "Cathartics," and a spirited discussion followed.

The next paper presented was that of Dr. W. L. Williams, entitled "Physiological Variations," the discussion of which, owing to lateness of the hour, was on motion of Dr. Trumbower deferred until 1897.

Dr. F. H. Miller presented a paper on "Diabetes Mellitus in Dogs," the discussion upon which was deferred as in the preceding.

The delayed report of the Committee on Diseases, Dr. Harger, chairman, was presented by Dr. John Wende. (See page 55.)

The following papers were read by title: "Nail Wounds of the Foot," by Dr. S. B. Nelson; "Millet Disease," by Dr. T. D. Hinebauch; "Veterinary Dentistry," by Dr. L. A. Merillat; "Some Poisonous Stock Foods," by Dr. N. S. Mayo; "Dairy Inspection," by Dr. F. Braginton: "Toeclip Injuries," by Jas. A. Waugh.

President Hoskins then announced the completion of the Thirty-third Annual Convention of the United States Veterinary Medical Association—the most successful in the history of the organization; in members in attendance; in the area of country represented; in character of membership attending; in papers and reports presented, and in all factors that go to make a national meeting. President-elect Dr. F. H. Osgood, of Massachusetts, was then introduced in a felicitous speech by the retiring President, who presented him with a gavel, the gift of the Buffalo veterinarians.

President-elect Osgood, in accepting the gavel, thanked the Association for the honor conferred upon him, and spoke in high commendation of the work of the retiring President, who, as Secretary for four years and President for three years, had been the chief instrument in bringing the Association to its present status from an humble organization, national only in name. He referred particularly to the presence at

this meeting of distinguished members of the profession from Manitoba and Canada, and from a large proportion of the States. On behalf of the Association he highly complimented the Buffalo veterinarians, who had provided by far the best social entertainment in our history.

Vice-Presidents-elect Bell, Trumbower, and Stalker were introduced by the President and accepted their offices in a few well-chosen words.

On motion of Dr. Cary, the Executive Committee was requested to select Nashville, Tenn., as the next place of meeting.

The Association then adjourned to reassemble at 8 P.M. in the banquet hall of the Genesee Hotel, where the largest company in the history of the Association surrounded the banquet table, including among the distinguished visitors Congressman Mahaney, of Buffalo; Dr. Tremaine, of Buffalo; Professor Andrew Smith, Principal of Ontario Veterinary College, Toronto, Canada; Professor D. McEachran, Dean of the Veterinary Department of McGill University, Montreal, Canada; and Dr. Miller, State Chemist of New York.

A rich repast was enjoyed by all, after which retiring President Hoskins, acting as toast-master, introduced the above-named visitors, who responded in a few well-chosen words of congratulation, followed by brief responses by Drs. Salmon, Law, Bell, Hughes, and others, after which the members bade each other adieu, and the most successful and enjoyable meeting in the history of this organization was brought to a close.

REPORTS.

COMMITTEE ON ARMY LEGISLATION.

To the President and Members of the United States Veterinary Medical Association.

GENTLEMEN: As chairman of your Committee on Army Legislation, I beg leave to submit the following report:

As soon as your committee was announced we began to arrange a definite plan to pursue during the coming session of the Fifty-fourth Congress.

In pursuance of this plan we wrote letters to each army veterinary surgeon, asking for his ideas as to the form of a bill to be presented to Congress. Thirteen of the fourteen army veterinary surgeons answered our letters, and the consensus of opinion was as follows:

"That the bill should seek to raise the pay, rank, and usefulness of the veterinary corps.

"That the bill should not only seek to elevate the individuals employed in the army as veterinary surgeons, but should raise the profession in general, as it related to the military service.

"That the bill should protect the army veterinary surgeons, many of whom have served from ten to thirteen years in the army, giving their best efforts and getting but a small remuneration in return.

"That the tone of the corps should be gradually raised by requiring future appointees to pass an exacting examination to show their fitness, morally and professionally, to be commissioned veterinary officers of the army.

"That any bill should be modest, in order that it might act as an entering wedge for future legislation."

Acting on these suggestions, your committee met in Washington and drew up the following bill, which was deemed satisfactory to the profession and to the army veterinary surgeons:

A bill to fix the pay, allowances, tenure of office, and rank of the veterinary surgeons of the United States Army.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the veterinary surgeons of

the United States Army shall be given the pay, allowances, tenure of office, and rank of second lieutenants of cavalry.

SEC. 2. That the number of veterinary surgeons in the Army of the United States shall not exceed two to each regiment of cavalry.

SEC. 3. That hereafter all appointments as veterinary surgeons in the Army of the United States shall be confined to graduates of recognized veterinary colleges of the United States, and candidates for such appointments shall be citizens of the United States and shall be required to pass such examination as the Secretary of War shall direct.

Having drawn up this bill, your committee, with a committee of the District of Columbia Veterinary Association, consisting of Drs. C. B. Robinson and H. W. Acheson, proceeded to the Capitol, and were very cordially received in the Military Committee room by General J. A. T. Hull, of Iowa, the chairman of the Committee on Military Affairs.

After presenting the members to General Hull, your chairman read the bill agreed upon, and gave reasons why it should become a law. Drs. Hart, Mackie, Robinson, and Acheson strongly defended the measure in short addresses. In reply General Hull said that it gave him much pleasure to receive us, and that he was heartily in favor of the measure and would personally take charge of the bill when it came before the committee. He spoke of the cordial reception given him at the banquet of the Association at Des Moines last year, and also of the rapid strides now being made in veterinary medicine and the lack of attention given to it in the army.

After our hearing before the Military Committee we waited upon many of the members of the House and Senate, among whom were Mr. Dovener, of West Virginia, who introduced the bill in the House, and Senator Roach, of North Dakota, who introduced the bill in the Senate.

The committee then went to the War Department, where we were received by General Nelson A. Miles, the commanding general of the army, who, upon hearing our bill read, stated that he saw no reason why it should not receive his support when it came before the department. In the evening a dinner was given to your committee by the District Association, for which we desire to return our thanks.

Your committee had over a thousand bills and circulars printed, which we sent to every veterinary surgeon in the United States whose address we could obtain, and we feel gratified over the result of this work, as we received hundreds of letters in return, many of which were of value to us in reaching Senators and Representatives.

Shortly after Congress convened it became evident to all that a "do-nothing" policy had been inaugurated for political purposes, and that no bills, no matter how important, outside of the regular appropriation bills, would be considered; hence your committee early perceived that the ultimate passage of the bill during the first session of this Congress

was almost impossible, so we devoted our entire time toward manufacturing sentiment among the members and working with the committees.

The bill was forwarded by the Military Committee to the War Department last January, and it remained unacted upon until April, owing to differences of opinion among the heads of the War Department.

The commanding general favored commissioning the corps, increasing it in number and in authority, and protecting the men who had served so many years in the army.

The Adjutant-General indorsed our bill so strongly that his report was embodied in the favorable report which the bill ultimately received from the Military Committee of the House.

The Quartermaster-General opposed the bill, holding that we should be made civilian employés, hired by contract at so much a month, giving us no military status whatever, not even quarters in the frontier posts, the result of which would make about twenty nice political appointments, which could be used by the party in power for its own advantage, as no civil service examination was contemplated. The results of this plan would be disastrous both to the profession and to the service, as it would have revived the political veterinarian who has been buried by the civil service rules.

The Assistant Secretary of War concurred in the opinion of the Quartermaster-General. The bill was returned to the Military Committee by the War Department with its disapproval, the reports of the Quartermaster-General and Assistant Secretary of War accompanying the bill, while the highly favorable reports of the Commanding General and Adjutant-General were entirely eliminated. The bill was now in a bad position to be considered by the Military Committee, and your committee felt that its efforts had been in vain. But right here the friendship of General Hull to our profession was clearly shown, when he promptly called for a full report on the bill by all of the military heads of the War Department, which reports were forwarded at once, and the bill was unanimously passed by the Military Committee the following day, the first time in the history of military veterinary legislation that a bill fully endorsed by the military heads of the army and the army veterinary surgeons and by the profession at large was favorably reported.

Mr. Hull, from the Committee on Military Affairs, submitted the following report :

The Committee on Military Affairs, to which was referred the bill (H. R. 3012) to fix the pay, allowances, tenure of office, and rank of the veterinary surgeons of the United States Army, have had the same under consideration, and amend it by striking out in section 3 after the word " colleges," the words " of the United States," and as amended recommend the passage of the bill.

The report from the Adjutant-General of the Army is hereto attached and made part of this report.

WAR DEPARTMENT, ADJUTANT-GENERAL'S OFFICE,
WASHINGTON, February 18, 1896.

SIR: I have the honor to return herewith a bill (H. R. 3012) "to fix the pay, allowances, tenure of office, and rank of the veterinary surgeons of the United States Army," on which the House Military Committee calls for report.

The veterinary surgeons in the Army of the United States are employed for service with cavalry regiments. Six regiments have one veterinary surgeon, who receives $75 per month, and four regiments have two, one of whom receives $100 per month and the other $75 per month.

These men are civilians, and their terms of office depend, in great measure, upon the pleasure of their respective regimental commanders, on whose recommendation they are appointed. Their duties require them to attend public horses at the post at which they may be stationed, or of the regiment when consolidated, whenever such animals are in need of medical treatment. These veterinary surgeons are necessarily dependent upon enlisted men for the assistance they may require in such treatment, and must give orders to these soldiers. The treatment of a sick horse is more difficult than that of a sick man, although their ailments are similar, for the reason that the man is able to describe his symptoms and the animal cannot do so. The veterinary surgeon is therefore entirely dependent upon what he alone can discover as to the ailment of his patient.

The pay of a veterinary surgeon, as now established, is hardly sufficient to command, permanently, talent and ability of such skilful professionals as are really required for the government. It happens at times that young men just from the colleges come into the service, and, after having gained experience, leave for civil life and more remunerative employment.

In the British and Italian armies veterinary surgeons are commissioned officers with military titles, of which the highest is that of veterinary colonel. In Germany and Austria they are military officials, but not technically officers. In France they have the status of commissioned officers with grades which correspond to those of the military establishment, and include that of lieutenant-colonel .

It is believed that by giving to veterinary surgeons the rank, pay, and tenure of office contemplated by this bill the army will secure better veterinary service than it can at present; that the efficiency of the cavalry arm will be increased, and that, as the result of the better care of public

animals, much money may be saved to the government. The bill is accordingly recommended for favorable consideration.

Very respectfully,

GEORGE D. RUGGLES,

THE SECRETARY OF WAR. Adjutant-General.

Your committee continued its labors with the members of the House of Representatives, and in less than two weeks we had enough votes pledged to carry it through if we could get it called up; but here the "do-nothing" policy of Congress was manifest. General Hull and others endeavored to get a time set aside for the consideration of military bills, but were refused repeatedly. Our bill was among the first on the list to be voted upon, and it yet remains in this position, and will be brought up the first day the Military Committee has a day during the next session, beginning next December and ending on March 4, 1897.

We firmly believe that it is only a matter of time as to the proper recognition of the profession in the army, for the War Department each year concedes points in favor of the veterinary surgeon which would hardly have been countenanced a few years ago.

The modern veterinarian, with his scientific training, is bound to command respect, and it behooves us to educate the public at large and especially members of Congress.

Your committee found some opposition at first among some members of the House, but it melted away when the situation was explained to them.

In the Senate, Senator Warren, of Wyoming, has been assigned to make the report to the Senate Committee on Military Affairs. He will favorably report it at the proper time, but advises that we use our energies toward getting it through the House, as there is some opposition to it from Senator Cockrell, of Missouri, and Senator Bates, of Tennessee, both of whom are on the Military Committee.

The opposition does not arise from the proper recognition of the army veterinary surgeon, but from the fact that if this bill becomes a law the veterinary surgeons will be given the privileges of the retired list, as now given to both officers and enlisted men of the army, and some of our short-sighted politicians desperately oppose any extension of the retired list, and many would have it abolished.

Only one veterinary surgeon in the army is eligible for retirement, and most of them would not retire for ten or fifteen years. This opposition to retiring veterinary surgeons was the only argument cast at your committee during the last session; and where is the justice of it? Surely, if an officer and an enlisted man can be retired on thirty years' service, or for disability or on reaching the sixty-fourth year of his age,

why not the veterinary surgeon, who is part of a cavalry regiment and who sees active service with it, and whose duties are continually more dangerous than the other parties eligible to this list?

In conclusion, your committee desires to thank the President, the Secretary, and members of the Association for much assistance given us during the last year.

The sum of $25 was appropriated by the Association for the legitimate expenses of the committee, and it is suggested that a sum of money be appropriated next year for printing, postage, etc.

Your committee also wishes to advise members of the Association and the profession to personally see their political friends and the members of Congress, and not to rely on letters, since few members see their correspondence, which is relegated to their clerks; and we trust that our members will endeavor to follow our suggestion and interview all the Senators and Representatives they can possibly reach before the convening of the next session of the Fifty-fourth Congress next December.

Respectfully submitted,

J. P. TURNER, Chairman,
JOHN R. HART,
F. H. MACKIE.

SECRETARY'S REPORT.

My predecessor's comments relative to the arduous duties of the office of Secretary were never so thoroughly impressed upon my mind as at this moment, and, by reason of the many details which have recently demanded my time, there has been no opportunity to prepare a report sufficiently full to convey to you a clear conception of the work done and yet to be done to place our Association in a position to more effectually carry forward the great educational plans so bravely and wisely inaugurated.

Our finances have fallen into an unfortunate state, and for want of funds the various committees have found it necessary to limit their activities, and general interest among our members in the work of the Association has waned because we have not printed and distributed the proceedings annually. There is a feeling on the part of many who are so situated that they cannot attend the meetings frequently, that they are getting no adequate return for the money paid as dues.

Your Secretary, who is the Association's collector, is made fully aware of this feeling among our members, and he has felt it incumbent on himself to encourage many members with the hope that the increased dues will be rewarded by a full report of this meeting, and that this report will be placed promptly in their hands. Of all the duties which have devolved on your Secretary, none has required more considerate and painstaking care than the collection of dues. Twice during the past Association year a statement of their account for dues has been sent to all members, while to delinquents three statements have been issued, each accompanied by a letter urging payment in part if the whole could not be spared.

Many members responded promptly, and the current expenses have been paid, a sufficient balance remaining to guarantee the publication of the proceedings of this meeting.

Very few of a long list of delinquent members have shown me the courtesy to reply to letters, and I am led to believe they do not estimate their membership as of any value to them, and it is plainly our duty to drop them from our roll. The effort to secure this delinquent fund has cost the major portion of the postage bill, amounting to some $47.13, and added not a little to the printing bill, besides entailing a very considerable clerical work.

The resolution adopted last year, requiring the initiation fee to accompany each application, will in a large degree prevent delinquencies by forcing the applicant to realize in some measure the financial side of membership before he is enrolled, and will keep out the men who never expect to help bear the expenses of maintaining the organization.

The correspondence on file shows there are a few delinquents who would pay if they could, and it would seem a wise policy to suspend their membership, and thereby stop the accumulation of dues until such time as they can pay the present account and be reinstated.

Several Resident State Secretaries kindly aided in the endeavor to revive the interests of our Association in their several States, and furnished this office with much needed information. The work which can be done by State Secretaries is of vital importance to this Association, and these officers should be esteemed and encouraged.

During the past year the revised Constitution and By-Laws have been printed and distributed to all the members. Fifty-one certificates of membership have been prepared and delivered to members who completed the conditions of membership since the last meeting.

The procuring of material for a programme is always one of much concern, and adds not a little to the cares of the Secretary, and were it not for the watchful interest and active co-operation of our honorable President, such a rich feast of intellectual food would not have been secured for this occasion.

Trusting the efforts of this office have been fruitful in promoting the best interests of this Association, this brief report is respectfully submitted.

S. STEWART,
Secretary.

REPORTS OF STATE SECRETARIES.

Louisiana.

Mr. President: As Resident State Secretary for Louisiana, I beg respectfully to submit the following report:

With regard to the regulation of contagious animal diseases in the State of Louisiana, we have an act which was passed by the State Legislature during the session of 1894. It is an act constituting the police juries of the different parishes of the State Live-stock Sanitary Commissions, with authority to enact and enforce ordinances and regulations for the suppression of glanders and other contagious diseases afflicting live-stock.

The act, so far as it goes, is very good; but one of the principal flaws in it seems to be that it does not go far enough. The police juries are empowered to enact and enforce ordinances, etc.; but if for some reason or other these local authorities do not see fit to take action, diseased stock in a parish may be allowed (in the case of glanders, for instance) to remain alive, and be a menace to that parish or even contiguous parishes.

An illustration of the above came under my own observation. An outbreak of glanders occurred in a livery stable in one of the country towns. Two qualified men were called in at different times, but unfortunately they differed in their opinions. I was called in consultation, and found nine horses affected with the disease. The owner, anxious to grasp at any straw, took advantage of the opinion that he thought favored him, and between himself, his friends, and the local authority, feeling "ran pretty high." For some reason or other, possibly a local political one, the police jury did not take action until at least six months afterward, when the owner removed his stock in a mysterious manner, and nobody seemed to know where he had taken them; but it was thought to the woods. It will be seen from this that there is something defective either in the law or in its execution. We hope, however, that by the time the Legislature holds its next session legislation on this subject will be in a much better shape. The city of New Orleans has, under its health ordinances, one regulating the proper disposition of the treatment and disposal of animals sick or suspected of being sick with glanders, and to prohibit and prevent the introduction of animals sick with that disease.

Outbreaks of glanders in the country districts of the State have been somewhat numerous during the past year. Personally I have been called to only one, which I have previously alluded to. I believe the major number were investigated by Dr. S. B. Staples, veterinarian to the State Experiment Stations, who, I understand, has furnished a report to the Committee on Diseases, and Dr. Arthur S. Wheeler, veterinarian to the New Orleans Board of Health, who has also, I believe, sent a report to the committee. These reports ought to supply fairly accurate information regarding this disease and its prevalence in the State.

Tetanus is of frequent occurrence. In my own practice I have had three cases to recover within the past year—all horses; two of the number without any treatment; the other after the administration of antitetanic serum.

Anthrax. One of the most extensive outbreaks of this disease that has ever been known occurred during the months of May and June of the present year in the northern parishes of the State. It existed both in the intestinal and cutaneous forms; but on account of the want of information on the part of the people regarding the disease, and consequently the lack of proper observation and investigation, the exact origin could not be traced.

In 1884, in that section, a similar but not so extensive an outbreak occurred, destroying animals of all kinds and some human beings as well. The carcasses were all left exposed, and no sanitary precautions taken whatever; and as we know from authorities on the subject that the spores, under favorable conditions, will retain their vitality for years, it is probable the late epizootic may have resulted from infected pastures, water supply, etc., due to the 1884 outbreak. There can be no doubt that although many animals, especially cattle, died from intestinal anthrax from the ingestion of anthrax spores while grazing over infected pastures, the most active agents in spreading the disease were flies of various kinds, notably the "Tabanus Lineola," which were in such vast numbers that they constituted a veritable plague. These flies were responsible for the larger percentage of animals, especially work stock, becoming affected with the cutaneous form of the disease, by transmitting the virus from the sick to the healthy animal.

The anthrax vaccine was used extensively all over the infected section. I was unable to remain sufficiently long in the infected districts to form a fair opinion as to the efficacy of the treatment, but I will quote briefly from two gentlemen to whom I wrote, asking each to furnish me as accurately as possible the results, and to give me his personal opinion as to the value of the inoculation treatment.

The following is from the general manager for a large cotton-planting syndicate: "We had the disease in its most virulent form, as you are

aware, losing every animal except one that was affected up to the time we commenced to use the vaccine treatment. Between the first and second doses of the lymph we had quite a number of new cases and a few deaths, but during this time the disease was in a much milder form. We even had a few cases and two or three deaths during the first four or five days after the second dose had been applied; but when the twelve days had expired we never had another case. I am a great believer in the Pasteur treatment; but I am a little puzzled to understand the experience of my neighbor, who used the vaccine at the time I did, and, until a few days ago, with the same satisfactory result; but he has just lost two horses that had the second dose of the lymph nearly a month ago. And one of his mules that was vaccinated at the same time, and which he says had had two genuine cases of the disease before the vaccination, is just now getting well of the third attack, which came upon him at least three weeks after he had had both doses of the lymph and after he had had the real disease twice."

The other correspondent, a practising physician, writes:

"In this immediate community about 250 animals were vaccinated at the height of the epidemic. Not 3 per cent. of this number were attacked after the first vaccination, and not 50 per cent. of this number died, and only two or three cases after the second vaccination, and no deaths. All the while unvaccinated animals were dying on adjoining farms." In another portion of his communication this gentleman says: "I should advise that all animals be vaccinated every year before the appearance of the disease, and this terrible scourge will be as surely removed from our midst as smallpox has been by vaccination."

Judging from the reports of these two gentlemen, who are thoroughly reliable, I think there can be no question as to the beneficial effects of the inoculation treatment.

I am not aware of any city in the State except New Orleans that has an ordinance relative to *milk inspection*. I find in the last biennial report of the New Orleans Board of Health an ordinance to fix a standard of purity of milk sold in that city; to provide for gratuitous furnishing of samples to health officers, and provide a penalty for violation of said ordinance.

The standard by which adulterated milk is determined is that which possesses a minimum specific gravity, actual density of 1.029 at 60° F., and containing not less than thirteen parts of total solids in 100 parts of milk, as follows: Butter-fat, 3½ per cent.; solids not fat, 9½ per cent.; water, not more than 87 per cent.

For six months of 1895 I find that 695 samples of milk were inspected, of which 625 were found to be good and 70 bad.

No record is given for the months of April, June, July, August, September, and October.

I would like to record two cases of parturient fever in the cow which responded to strychnine treatment. One of these cases, which was treated with liquid strychnine hypodermatically, is mentioned in my report to the Committee on Diseases. The other occurred since making that report.

The animal had just finished her fifth parturition, and was semi-comatose when I was called to see her. I prescribed powdered nux, one ounce and a half, in spiritus frumenti one pint. Two ounces of the mixture in as much water, to be given every two hours (as suggested by Dr. Perley, of St. Albans, Vt.). Seven doses had been administered, and when the owner went to give the next dose he found the patient up and walking around, lowing for her calf, apparently in perfect health.

Since writing the previous part of this report I am gratified to be able to record a second recovery from tetanus following treatment with antitetanic serum.

The patient was a black gelding, rising five years old, sixteen hands high, and weighing in the neighborhood of 1250 pounds. All the prominent symptoms were present. Trismus, however, was not complete, and the lateral movement of the jaws, although restricted, was sufficient to permit of the mastication of food. Deglutition, although somewhat impaired, remained good.

The horse came to my infirmary at noon on August 12th, and the following is a record of the doses:

August	12th.	12 Noon.	20 c.c.	Pasteur's	tetanus	antitoxin subcutaneously
"	12th.	6 P. M.	20 c.c.	"	"	" "
"	13th.	12 Noon.	20 c.c.	"	"	" "
"	13th.	6 P. M.	10 c.c.	"	"	" "
"	13th.	12 Midnight.	10 c.c.	"	"	" "
"	14th.	12 Noon.	10 c.c.	"	"	" "
"	14th.	6 P. M.	10 c.c.	"	"	" "

At this stage the progress of the disease seemed to be checked, and improvement gradually set in.

During the whole course of the treatment the appetite was good, in fact, exceedingly so.

When I left home on Wednesday last, the 26th instant, the animal was almost well.

It gives me pleasure, also, to be able to report two applications for membership in this Association. One is Dr. Arthur S. Wheeler, veterinarian to the New Orleans Board of Health, and a graduate of the veterinary department of the University of Pennsylvania. The other, Dr. S. B. Staples, veterinarian to the Louisiana State Experiment Stations and a graduate of the American Veterinary College, N. Y.

W. H. DALRYMPLE,
Secretary for Louisiana.

Connecticut.

Mr. President and Members of the United States Veterinary Medical Association: I have the honor to present for your consideration the following report on behalf of the veterinary profession of Connecticut for the year 1895-96:

As a number of important changes have been recently made in regard to our laws concerning the contagious diseases of animals, and as such laws, when they exist, materially affect our work, I wish first to speak of them. Formerly the Connecticut law for the suppression of glanders required that all outbreaks be reported within forty-eight hours to the Commission on Diseases, and upon satisfactory evidence that a horse was glandered the animal was destroyed without appraisal. This was apparently unsatisfactory to many of our people, and at the last session of our Legislature many amendments to it were proposed. These were followed by an extended debate, the result of which has been to limit the power of our Commission on Diseases of the Domestic Animals to a simple quarantine of horses suspected of being glandered, the final disposition of them being left to other parties. As a matter of fact, such of these animals as are not destroyed by their owners are taken charge of by the Society for the Prevention of Cruelty to Animals.

The subject of tuberculosis and the use of the tuberculin test as a means of limiting the amount of this disease among our neat stock was also the subject of much debate and contention, the result being that the whole matter was left in the hands of the commissioners, who were given power to quarantine all suspected animals and to make a physical examination of any animal or animals with or without the consent of the owner. The use of the tuberculin test was absolutely restricted to be used only when the owner of the animals requests, in writing, that it shall be employed as a means of diagnosis, and when such owner also executes a written agreement that he will not afterward introduce any untested animals into the herd.

All animals that are condemned as tuberculous as a result of either of these methods of examination are, after being appraised by agreement between one of the commissioners and the owner, destroyed by the commission, generally at a public slaughter, the owner receiving full agreed value for all animals so appraised and destroyed.

The Legislature did not make any special appropriation for the work, but gave the commisioners power to draw upon the Treasurer of the State for all necessary funds, provided the approval of the Governor accompanies all such drafts. This law, although incomplete and allowing the commissioners so little control, has so far served as an excellent means of educating the public as to the value of the tuberculin test and the presence and appearance of tuberculosis.

There has been a steady increase in the number of applicants for the test, and with the wider knowledge of the facts before them our people are beginning to hold the work of the commissioners in higher esteem and to appreciate more fully the goodness of their work; all of which must eventually lead to the enactment of laws that will better enable the commission to control the spread of this most insidious of all our animal plagues which are communicated to mankind.

From January 1 until July 15, 1896, 2032 animals were examined, of which 349 were condemned and killed. Since writing this report over 700 animals have been examined.

The tuberculin test has proved itself to be so reliable and its use has shown itself to be so free from any ill results to healthy animals that a very large number of those who were opposed to its use on purely theoretical grounds have, upon seeing its actual results, become its admirers and firm upholders. One effect of the law so far has been undoubtedly to give a purer milk supply to the urban consumers. In one portion of our State a large creamery association, receiving products from over 1500 cows daily, has refused to take any more milk from cows that cannot show a certificate of having passed a proper tuberculin test.

Our laws further provide for a quarantine against all cattle entering the State without permit. Upon application permission to enter is granted: 1. To such animals as have been properly tested just prior to seeking entrance, and are so shown to be free from disease. 2. To those that seek entrance for immediate slaughter, which slaughtering must, however, be done in the presence of one of the commissioners. 3. To those who will hold the animals after their arrival until the tuberculin test is applied to them by the commission.

During the past year several outbreaks of various contagious diseases have been reported throughout the State. In January a severe outbreak of cerebro-spinal meningitis occurred in Bridgeport; it started with terrible rapidity, but, by most excellent precautions, was as rapidly confined to two of the larger stables. The Mayor of that city promptly called a meeting of the city Board of Health, to which the veterinarians of the State were also invited. At this meeting suggestions were offered and resolutions passed warning the public of the dangers, closing public watering-troughs and placing quarantine restrictions upon all infected places. The outbreak destroyed some fifty horses, forty of which were in the original location of the outbreak.

There have been several outbreaks of "hog cholera," all of which have been confined to the premises upon which it first appeared or near by.

Influenza is always present, especially in the springtime. My impression is that it was somewhat especially prevalent the present year, and throughout the State. Tetanus, actinomycosis, strangles, glanders,

and some of the minor parasitic diseases have been reported from time to time during the past year.

The Connecticut Veterinary Medical Association has been very prosperous during the year; its meetings have been well attended, and its members have expressed themselves as finding these semi-social gatherings both interesting and profitable. The membership is increasing in numbers, and there is every prospect of a prosperous future.

R. P. Lyman,
Secretary for Connecticut.

New Hampshire.

Mr. Chairman and Members of the United States Veterinary Medical Association: As Resident State Secretary of New Hampshire I have the honor to present the following report as required of my office:

There are at present some thirty-one non-qualified men practising in New Hampshire, and but seventeen qualified veterinarians, twelve of whom are members of the New Hampshire Veterinary Medical Association, which was organized in May, 1895. During the last year we have gained in membership and are more bound together than heretofore. Qualified veterinarians of the State of Vermont have recently been asked to join us in a union meeting, hoping in this way to start an association in that State. A committee appointed to draw up a bill relative to the registration of veterinarians throughout the State is actively at work, and we are expecting favorable action by the Legislature next January.

We have a cattle commission of two members—a physician at its head. No regular veterinarian is connected with the board, the work falling to those resident in the district where cases are reported. The appropriation is ten thousand dollars a year for this work, which will not go far, especially as the State has been under quarantine only since July 15, 1896. Previous to that time New Hampshire has been a convenient dumping ground for three States. In a letter recently received from the secretary of the commission he states that since January 1st of this year they have tested with tuberculin ninety-eight herds and destroyed two hundred and thirteen animals. Unfortunately he has no record of the total number tested. He says further that only two horses have been destroyed for glanders during this time.

The local boards of health are not responsible to the State Board, hence the want of co-operation.

The offices of meat and milk inspectors throughout the State are very few, Manchester being the only city having either.

Tuberculin has been used mostly on cattle that were to be shipped to other States. Although the commission do not use it generally, they still reserve the right to.

Mallein has been used only in a few isolated cases by veterinarians.

No knowledge of the use of anthrax vaccine has come to us, and only two cases of the use of tetanus vaccine in which they discourage its use.

Since writing my report, during the early part of the month of August parties resident in Lynn, Mass., went to Jaffrey, New Hampshire, prepared to camp out. With the party was a dog. After two or three days the dog acted strangely and disappeared in the night, biting several dogs, cats, and calves, and was finally shot the next morning.

Ten days after a few calves in the neighborhood were taken sick, and were said by physicians to be rabid ; also a few cats, which were killed. Three days later a family cat acted strangely and bit a woman in the thumb and a child in the calf of the leg. The dogs have since been ordered muzzled by order of the local authorities.

This is very interesting, I think, owing to the history of the dog having come from Lynn, where recently "rabies," I understand, has been so prevalent.

L. Pope, Jr.,
Secretary for New Hampshire.

New Jersey.

Mr. President and Gentlemen : I have the honor to present the annual report of your Resident State Secretary for New Jersey.

In proportion to the population and area, New Jersey has her share of veterinarians, and I am proud to say has among the number many distinguished and successful practitioners, but unfortunately there is not a proper State organization or society. I believe there are two associations, both claiming to be regular State organizations.

The newer society is exclusive and admits only college graduates, while the membership of the older society is made up of both graduates and non-graduates. The societies are antagonizing each other, to the detriment of both, and in this way have lost a certain amount of prestige. As I see it, no effective work can be accomplished until both factions are brought together and an amalgamation effected. This, it seems to me, might be done on a satisfactory basis to both parties, inasmuch as we have now a State law regulating the practice of veterinary medicine and surgery.

This law recognizes two classes of practitioners, viz., the college graduates or regulars and the non-graduates or "existing practitioners," as they are termed in the statute. These "existing practitioners" are those men who practised veterinary medicine and surgery for five years before the passage of the law without a diploma and registered within six months after the approval of the act by the Governor. Now, if both societies would amalgamate and incorporate into a regular State organization, admitting all licentiates, both graduates and non-gradu-

ates, I think everything would work all right. The graduates are in the majority, I think, and if not they soon will be, for new members can now only enter practice in our State as graduates.

Recent legislation gives local boards of health the power to appoint a veterinary inspector. Many of the Boards of Health have already appointed their veterinarians, and this addition cannot help but be a very essential requirement from a sanitary standpoint.

We have no veterinary institutions in our State; but this, I think, is a good thing under the present conditions. We believe we can do more good to the profession by aiding the higher veterinary colleges already established. New York State, Pennsylvania, and several other States, I believe, have been successful in passing laws for the appointment of a State Board of Regents. We should have a State Board of Regents in New Jersey if in any State of the Union. All grades of practitioners come here from colleges of various degrees of standing.

The general oversight of contagious diseases comes under the State Board of Health, which has done much effective work through its veterinary inspectors. The only contagious disease that has been taken out of its hands is bovine tuberculosis. A recent Legislature passed special legislation to protect the public health from this disease, and provided for the appointment of a State tuberculosis commission, which is doing effective work.

Herds of dairy cattle in different parts of the State have been inspected and the tuberculin-test made. Diseased animals have been paid for by the State, at the rate of three-fourths their appraised value.

I regret that I am unable to state just what contagious diseases we have had during the year, as I have been unable to obtain the desired information from the Secretary of the State Board

The number of veterinarians is rapidly increasing in our State, and from what I can learn private practice has been fairly good.

I am pleased to say that the public of New Jersey appreciates the up-to-date veterinarian, and he has their support and respect in all cases where he deserves it.

Very respectfully,

J. Payne Lowe,
Secretary for New Jersey.

California. (Read by title.)

San Francisco, Cal., August 19, 1896.

To the Members of the United States Veterinary Medical Association, Buffalo, N. Y.:

Gentlemen: Your Assistant State Secretary begs leave to submit the following as his report for the State of California:

The past year has been a quiet one in Association circles. The little

interest evinced by some of the members of our profession in regard to our national organization has gradually died out, till, in fact, I doubt much if there are three veterinarians in the State who realize or care whether such an organization exists or not. At least I know of only three or four members of the profession who are sufficiently interested in retaining their membership by paying their dues.

And so it is with our local organization. For the past two or three years the responsibility of upholding and nurturing our State Society has devolved on three or four members who love their profession and who are willing to sacrifice themselves, their time, and their money.

It is not only impossible to get the members to attend the meetings and evince a little interest in professional and scientific matters, but it is impossible to prevail on some of them to pay their dues and retain their names on the roll of membership.

I am unable to account for this state of affairs, unless it be due to the depression in business matters and to the depreciation in the value of live-stock.

It is a source of great grief to me to have to chronicle these facts, but I deem it my duty to portray to you, gentlemen, the real condition of the existing circumstances, with this end in view, that you, judging from your experience in your respective localities, may be able to counsel us as to the best method of procedure by which we may correct the existing conditions.

I have labored hard but unsuccessfully to prevail on the members of our profession in this State to send a delegate to the meeting at Buffalo, with instructions to labor unceasingly with a view of inducing the Comitia Minora to select the Pacific coast as the meeting-place for 1897. Last year, prior to the meeting at Des Moines, our local association elected your humble servant as a delegate to that meeting, and levied an assessment to defray my expenses. We failed, however, to realize enough on the assessment to carry me out of the State, much less to take me to Des Moines and back. Can you wonder, therefore, that some of us, even though we are thoroughly imbued with the idea of elevating the profession we have the privilege of representing, are discouraged and disheartened. I firmly believe that nothing short of one of our Eastern cyclones would rouse the members in this State from the lethargy into which they have fallen.

Some two years ago a veterinary college was inaugurated in this city under very auspicious circumstances indeed; but so far it has not been a success, for the reason that in the first place the members of the Faculty do not work in harmony, and in the second place the majority of the members of the Faculty have not the advancement of their profession sufficiently at heart to sacrifice themselves for the benefit of the students; furthermore, some of them are on the Faculty more with the

object of personal gain rather than that of elevating and ennobling their profession.

There have been no outbreaks of contagious and infectious diseases worthy of mention, and, as I have already given the Committee on Diseases all the information in this particular at my command, I do not deem it necessary for me to enter into a dissertation on diseases in this report.

Our State Board of Health has taken up the Texas-fever problem with a view of relieving stockmen of the quarantine restrictions imposed upon them by the Federal authorities. What will be the outcome of this movement it is impossible to surmise at the present time, but I do not fancy that the State authorities will be able to improve the methods of the Federal authorities for controlling this disease.

The municipal boards of health throughout the State are up in arms against that insidious disease, tuberculosis, among dairy cattle, which, by the way, exists to an alarming extent in some dairies in the vicinity of some of the larger towns and cities. One or two herds that have been tested with tuberculin so far have shown 80 per cent. affected.

In the larger cities of the State the health authorities have succeeded in having ordinances adopted licensing dairies and requiring milk to be up to a certain standard before permitting it to be sold, also requiring dairies to submit their cows to the tuberculin-test before they can obtain a license. While these measures are of a radical nature, and while the dairymen are inclined to place obstructions in the way of their enforcement, still I believe they shall eventually prove to be successful and a great step toward the eradication of this malignant disease.

I should most respectfully suggest that this organization take some action regarding the matter in which final examinations are held in the different colleges throughout the United States. I believe the time has come when each and every college should have a board of examiners, this board to consist of a number of practising veterinarians who are in no way connected with the Faculty. A movement of this nature would do a great deal toward elevating the profession.

Hoping you will have a successful and enjoyable meeting, I have the honor to be yours, most sincerely,

R. A. Archibald,
Resident Secretary for California.

Indiana. (Read by title.)

Gentlemen: For the part of my report relative to the prevalence of diseases I am indebted to Purdue University for bulletins furnished me (which are compiled from reports gathered from the profession at large).

For the first half of the year 1896 there were reported: Actinomy-

cosis, eighty cases; glanders, ten cases; a few cases of hog-cholera and swine plague in a mild form; influenza, seven hundred and eighty-seven cases; tetanus, one hundred and thirty cases; rabies, thirty-three cases; caries of the teeth, one hundred and twenty-two cases; cerebro-spinal meningitis, twenty-two cases; colic, one thousand and eighteen cases; enteritis, eighty-one cases; gastritis, eighty-two cases; osteo-porosis, seven cases; parturient apoplexy, one hundred and thirty-three cases; periodic ophthalmia, one hundred and forty-two cases; pneumonia, one hundred and sixty-three cases; pleurisy, ninety-two cases; fistula, two hundred and nineteen cases.

Sporadic ophthalmia has made its appearance again in part of Lake County. It seems to be confined to the marshy lands that have been reclaimed, and is most severe in dry and hot weather. The first symptoms noticed are a cloudiness of the cornea with an increased flow of tears. After a few days of intense inflammation the cornea ulcerates and there is protrusion of the iris, after which the inflammation rapidly subsides. After a herd is attacked none escape, and the termination in most cases is total loss of vision.

The Indiana Veterinary Association is in a very prosperous condition.

There is no legislation in regard to the regulation of veterinary practice, consequently every town is infested with illiterate quacks. During the last session of the State Legislature a bill was formulated by the direction of the Veterinary Association, but it did not become a law.

I think that often a mistake is made in thinking that legislation is to protect the veterinarian, when in fact it is to protect the public.

Respectfully,

F. Braginton,

Secretary for Indiana.

Iowa. (Read by title.)

Dr. S. Stewart, Secretary.

Herewith I hand a report as State Secretary of the United States Veterinary Medical Association for the year ending August 20, 1896.

The year has been an exceedingly quiet one with the profession in this State, with perhaps a very few exceptions.

The low value of stock and the scarcity of money have rendered the practice of the veterinary profession far from lucrative.

During the past year no extensive outbreaks of disease among the live-stock of this State, with the exception of diseases among swine, have been reported.

There have been a few outbreaks of glanders, rabies, and anthrax, but none of these have assumed alarming proportions.

In some localities a very mild form of typhoid fever among horses has prevailed.

During the late fall and early winter a few outbreaks of a disease among cattle running in cornstalk fields, the nature of which was not well understood, were reported.

Only a limited amount of tuberculin work has been done.

In regard to legislation, will say that none was enacted at the last session of our Legislature bearing directly upon the veterinary profession or the live-stock industry of the State, except one act, which is intended to prohibit traffic in dead swine. Bills were introduced looking to the control of tuberculosis and other animal diseases, also extending the duties of the State Dairy Commissioner to one having in view the inspection of milk and meat products (see copy in the February, 1896, number of the *Journal of Comparative Medicine and Veterinary Archives*, page 141). This bill met its fate in the committee-room. At one time the prospect of legislation along this line seemed very good, but some of the leading veterinarians of the State fought the measure to the end, and this, no doubt, did much to defeat any legislation in this direction. A bill to control the title of veterinarian met the same fate.

The State Board of Health has formulated a rule declaring all public stock-yards as being permanently infected with swine disease, and prohibiting stockers, *i. e.*, animals for feeding and breeding purposes, from passing through such yards except under prescribed regulations. It is intended to work along the same lines as a ruling of the Secretary of Agriculture relative to interstate trade; also a rule requiring all stock exhibited at the large fairs or stock shows to be examined daily by the State veterinarian or one of his assistants. This will work as a protection not only to the exhibitor, but the communities from which he comes, thereby reducing to the minimum the danger of diseases being spread by this very common source. This regulation promises to become very popular both with the associations giving these exhibitions and the exhibitors.

G. A. JOHNSON,
Secretary for Iowa.

MARYLAND. (Read by title.)

MR. PRESIDENT AND GENTLEMEN: Regretting that circumstances are such that I cannot make this report in person, I tender the same through my friend, Dr. A. W. Clement.

The progress of veterinary science in our State has been very favorable.

The constitutionality of the Maryland State law governing the practice of veterinary surgery has been tested in the case of State *vs.* John C. Siegmund, graduate of the National Veterinary College, Class of 1895. Dr. Siegmund graduated after a two-year course, whereas the

law calls for diplomas issued to graduates of three-years' study after January 1, 1895.

The work of the State Board of Veterinary Examiners has been commendable, although the greater part of the duties have been left to two or three members of the commission.

Unfortunately the State does not appropriate any money for the maintenance of the board, hence the individual members have been put to personal expense to carry on the registrations, etc.

At a meeting called and held at the Hotel Rennert, in Baltimore, by the registered veterinarians of the State, quite a number responded in order to effect a permanent association of registered practitioners.

The object of the Association was to provide ways and means for the maintenance of the Board of Veterinary Examiners, also to discuss the advisability of securing an amendment to the State law through the Legislature then in session.

The discussion of the ways and means question was interesting, inasmuch as several of the gentlemen present thought the Board had made a mistake and were to blame for not taxing the practitioner a registration fee as he came to register. The same gentlemen in all probability would have seriously objected had they been taxed at the time of their registration. After some little discussion it was decided upon to tax each practitioner two dollars. The second question was thoroughly discussed, and an amendment was prepared and presented before the Legislative Assembly. The bill was not favorably reported, very likely due to the fact that another bill or two had the sympathy of the Assembly. Dr. J. C. Siegmund, finding that he could not register under the existing State law, succeeded in getting a bill passed exempting him from the law and registration and allowing him to practice. The efficiency of the bill has never been tested.

Another veterinarian succeeded in having his entire county exempted from the State law.

The Maryland State Veterinary Medical Society held quarterly meetings, which were well attended, instructive, followed by light dinner and general sociability of the members present.

The change in the State government brought about the retirement of Dr. Robert Ward and the appointment of Dr. A. W. Clement as State veterinarian.

I will refer you to him for information regarding a report on the occurrence of diseases other than those met with during the general run of a practising veterinarian.

Thanking all for their patience in listening to this report, wishing all and the society God-speed, I remain, sincerely,

WILLIAM C. SIEGMUND,
Secretary for Maryland.

MASSACHUSETTS. (Read by title.)

MR. PRESIDENT AND GENTLEMEN, MEMBERS OF THE UNITED STATES VETERINARY MEDICAL ASSOCIATION: I desire, in making my report for the year as State Secretary, to be brief and simply to make a due statement of matters in this State of interest to our profession.

There have been during the year no outbreaks of disease of an epidemic character. The only question which has created much discussion or interest is tuberculosis. This disease has created, or rather the suppression of this disease, a great deal of interest not only among members of the profession, but among the laity.

The question of the reliability of tuberculin as a diagnostic agent seems to be settled beyond a doubt by the candid man. There are and always will be doubting Thomases, but the mass of evidence and experience seems clearly to be in the affirmative.

Extended and interesting hearings were held during the past winter by the Legislature upon this and kindred subjects, at which neighboring States were represented by their officials, and the general expression of opinion from them was that Massachusetts had started upon the proper course, and they heartily sympathized with the action taken and would co-operate with her.

There has been opposition to the work of our State Cattle Commission, some of it honest—some of it anything but honest—much more coming from a desire apparently to be seen and heard of men than from honesty of purpose. The profession, as a rule, has been in sympathy with the work carried on, but I regret to say there have been a very few who have evidently found that the grapes were sour which were presented to them, while with others there has been simply a candid difference of opinion and belief.

The general feeling among the cattle-owners of the State at the present time is that the sooner tuberculosis is eradicated from our herds the better.

No new movement, however radical or however mild its requirement, is ever instituted without creating a discussion and opposition as to its value and utility. Honest criticism, above all, is to be invited; while, on the other hand, dishonest criticism is to be deplored, as it not only checks for the time the good move, but becomes, many times, a boomerang to the innocent parties who are led to criticise.

I had expected to be able to meet with you, but circumstances prevent, and so I must wish you an interesting and valuable meeting.

Yours very sincerely,

MADISON BUNKER,
Secretary for Massachusetts.

Ohio. (Read by title.)

Mr. President and Gentlemen: When we take into consideration the wonderful decrease in the live-stock and breeding interests of Ohio as reported from the office of the State Auditor, we veterinarians can console ourselves in being able to still keep our heads above water. The footings show a decrease for the last two years of 65,342 horses, 120,668 cattle, and 1,261,765 sheep. This deplorable shrinkage in our field of operations may be ascribed to electric power, bicycles, restriction on cattle exportation, and free wool. In the same proportion that the stock interest depreciates so must our profession necessarily suffer.

The veterinary profession in the State of Ohio has experienced a few changes in the past year which may be worth mentioning. One of these is the failure of the Ohio Veterinary College to continue business, which may be considered fortunate or unfortunate, according to whom it may concern. Whenever a veterinary college is organized in a State it is generally regarded by the public as being an advance step in the veterinary profession, such as was the case in our State when this now defunct institution was founded in Cincinnati. If, however, we take into consideration the small amount of good it has accomplished during its short educational career, the collapse of the college may be looked upon as a greater advance step than its organization. An exhausted treasury and a falling off of matriculants have caused the Ohio Veterinary College to close its doors, in all probability never to be reopened.

The only veterinary instruction to be obtained at present in the State is at the Ohio State University, Drs. Ball, Lavery, and White instructors—the former a graduate of the American Veterinary College, the two latter graduates from the University. The Ohio State Board of Veterinary Examiners have been hindered in various ways from carrying out their work satisfactorily. There is no clause in the law regulating the practice of veterinary medicine which requires the registration of practitioners, hence they cannot keep track of persons practising illegally. Neither can practitioners be compelled to take the examination except by prosecution, for which purpose there is no money in the treasury. Again, there has been a disturbing element which the Board has had to contend with. According to the law, all those who have been practising veterinary medicine continually for three years prior to May 21, 1894, were permitted to continue, while all others were obliged to be examined. This caused graduates between the years 1891 and 1894 who were not in practice to manifest opposition and refuse to take the examination. The Board, at its last meeting in July, adopted the following rule, which will no doubt satisfy this anxious faction: "All diplomas or certificates issued by reputable veterinary schools or colleges prior to May 21, 1894, may be accepted by a vote of the Board

of Examiners in lieu of an examination." Another impediment to their progress is the lack of funds. The money realized from examinations does not begin to defray expenses; and until a registration clause, with a fee attached, is appended to the law there will be no money in the treasury to prosecute illegal practitioners unless the State Veterinary Medical Association or the veterinarians individually within the State come to the front with contributions for this purpose. To endeavor to secure appropriations from the State Legislature to supply the deficiency of the Board would be unquestionably futile. To assist the Board in their work means a benefit to the veterinarians of the State. It elevates the standard of the profession and regulates the quality of the incoming practitioner, since all practitioners must hereafter appear before the Board for examination, regardless of what institution they hail from. The examinations have generally been regarded as rigid by the candidates, but the Board was very lenient thus far in its gradations, 60 per cent. being the necessary average.

Ohio has been remarkably free from contagious disease, though hog-cholera has been unusually prevalent this year. Our Live-stock Commission has made some researches in connection with this disease, both practically and microscopically. Minor outbreaks of Texas fever have occurred, though held in check by quarantine regulations being carried out by the district veterinarians. Glanders has been less prevalent by 50 per cent. than during the preceding two or three years. Tuberculosis undoubtedly exists throughout the State to a greater or less degree, and it is highly important that the Live-stock Commission, by a special act of Legislature, be required to investigate and eradicate this latent disease, which is so dangerous and fatal to the human family. I would suggest that we begin the investigation at our public institutions, as I have good reasons to suspect its existence in one of them. Where it exists in one herd it is liable to prevail among others. The methods of diagnosticating and exterminating tuberculosis employed in some of the Eastern States should be adopted here. Ohio should have a State veterinarian, whose sole duty it shall be to make the necessary investigations and recommendations regarding contagious and infectious diseases. One who is a competent microscopist, one who is an enthusiastic and conscientious worker, and one who is able to write an intelligent annual report. This work would occupy a man's entire time and attention, making it impossible for him to follow any other pursuit in connection without neglecting the duties of his office. At present the commission has district veterinarians located in the larger cities of the State, who are paid only when their services are called upon.

Respectfully submitted,

J. C. MEYER,
Secretary for Ohio.

WASHINGTON. (Read by title).

PULLMAN, WASH., August 20, 1896.

I beg to report for the State of Washington for 1895–96, as follows: Practice has for the past year been quite dull, as a result of the great decline in value of all stock, also because the lightness of sporadic diseases in the Northwest.

There is talk of forming a State Association, which may take definite form this coming winter.

There has not as yet been any attempt to regulate the practice of veterinarians in the State by any legislative act.

Each county in the State has its sheep inspector, without whose permit no sheep can be driven from one county into another.

The State veterinarian has general supervision over all contagious and infectious diseases among the domestic animals in or in transit through the State.

The State Board of Health boasts of having two veterinarians as members of it.

Respectfully submitted,

S. B. NELSON,

Secretary for Washington.

REPORT OF THE COMMITTEE ON PUBLICATION.

To the President and Members of the United States Veterinary Medical Association.

Your Committee on Publication desires to report that upon its appointment last year it was found that our finances were in a very serious condition, our treasury being not only depleted, but suffering from a deficit of several hundred dollars, and in addition the proceedings of 1894 remained unpublished.

We fully realized that the dignity and honor of the Association were at stake, and that if we were to retain our position as a scientific society we should publish and place in enduring form the records of our annual conventions; and in accordance with such views we turned our attention to devising ways and means for publishing the TRANSACTIONS of the meeting of 1895. A survey of our financial condition soon convinced us that were we to proceed to publish the TRANSACTIONS of the Des Moines meeting in regular form it would consume all receipts for the year, above the unavoidable current expenses, and bring us to the present meeting with a very serious deficit, a state of affairs which we deemed unwise and imprudent.

We held that the funds collected since our last meeting should, after the payment of outstanding debts, be applied to the publication of the proceedings of the present meeting, and that consequently the use of these for publishing the TRANSACTIONS of the Des Moines meeting would in effect be the misappropriation of the funds.

We concluded, therefore, to leave the Association funds practically untouched, and aid thereby so far as in our power the executive officers in wiping out our deficit and coming to this meeting with a fair working fund, which we are pleased to say is now assured.

Under these conditions we attempted to contrive some means for publishing our proceedings in a satisfactory way at a nominal cost.

We first attempted to supply the papers and proceedings to our three journals, permit their publication in their columns, and preserve therefrom reprints at a purely nominal cost. All the journals responded promptly and courteously, and tendered their hearty support of the plan; but it was found impracticable, as the three journals each print different sized pages in different type, and it was also found impossible to successively page these reprints.

The next best course which seemed open was to induce, as far as possible, the printing of our proceedings in the three journals and permitting them to serve as a record.

The journals came promptly and heartily to our support, and as a result all papers and committee reports have appeared in full in one or more of our veterinary journals, as follows:

Summary of Des Moines meeting, J. C. M., vol. xvii. pp. 67–70, 232–236.

Report of State Secretary for Massachusetts, J. M. Parker, V. M., vol. ii. p. 529; A. V. R., xix. p. 379.

Committee on Intelligence and Education, C. A. Cary, R. A. Archibald, W. B. Niles, J. C. M., vol. xvii. pp. 97, 139, 174.

Report of Prize Committee, Tait Butler, A. V. R., vol. xix. p. 607.

Report of Committee of Diseases, M. R. Trumbower; Section 1, general; Section 2, Illinois; Section 3, reports from various States; A. V. R., vol. xix. p. 477, 548, 612, 775; V. M., vol. ii. p. 678; Section 3½, A. Liautard; Section 4, John Faust, Tuberculosis; Section 5, John Faust, Sympt. Anthrax, A. V. R., vol. xix. pp. 400, 411; V. M., ii. p. 775; Section 6, Harger, Pennsylvania; Section 7, Dinwiddie, Texas-fever; Casting Accident, Butler, V. M., vol. ii. pp. 688, 771, 519.

Anæsthetics, Meyer, V. M., vol. ii. p. 523.

Neurotomy, McKillip, J. C. M., vol. xvi. p. 638; A. V. R., xix. p. 420; V. M., August, 1895.

The Horse as a Producer of Antitoxins, Schwartzkopff, V. M., August, 1895; A. V. R., xix. p. 391; J. C. M., vol. xvii. p. 13.

Therapeutics of Colic, Williams, A. V. R., vol. xix. p. 457; J. C. M., vol. xvi. p. 613; V. M., August, 1895.

Report of Committee on Army Legislation, J. C. M., xvi. p. 771.

Presidential Address, J. C. M., xvi. p. 771.

Arytenectomy for Roaring in the Horse, Harger, V. M., ii. p. 555.

With this accomplished we permitted our labor to cease in so far as the proceedings of the meetings of 1895 were concerned, with the hope that you will approve our efforts rather than our accomplishments.

It became evident to us, however, that our present arrangements for publication of proceedings were imperfect, inadequate, and, in our condition, financially impracticable, and we have consequently given more thought to some feasible plan for the future than to the work for which we were ostensibly appointed. In addition to the financial difficulties we found other serious embarrassments.

1. We found that the proceedings of the Society are not delivered into the hands of the Committee on Publication with due promptness, thus rendering their work disagreeable and necessarily ineffectual, since to prove effective the publication should be prompt and be placed in the hands of our profession while yet fresh and new.

2. We found that copies of reports and papers were furnished in abundance to our journals, enabling them to publish these in advance of possible publication by our Society, destroying to a degree the value of our proceedings in separate form, and crippling the value of reports and papers by having them appear alone without discussions thereon, which really serves to test and seal their worth.

3. We found that the committee was much embarrassed by being appointed after the meeting was over, the proceedings of which they were to edit, so that they were placed in charge of a work without needful preparation of watching the proceedings from the first with their duties fully in view. After much thought regarding this very important matter to the welfare of our Society, we have decided to recommend:

First. That essayists and committee reporters be enjoined from furnishing copies or extracts of their papers or reports to veterinary or other journals except by special permit.

Second. That the Publication Committee be empowered to demand the filing of copies of all reports and papers with its chairman not less than thirty days prior to date of meeting.

Third. That the matter of stenographic reports be placed in the hands of the Publication Committee and they be directed to secure type-written copies of stenographer's report of each day's proceedings on the morning of the subsequent day, and submit these, as far as possible, either in full or abstract to the authors for their approval or correction.

Fourth. That it shall be the duty of this committee to proceed at once to edit the TRANSACTIONS and have them ready for publication within fifteen days after the meeting.

Fifth. In order to facilitate such a course we recommend that the Publication Committee be appointed one year in advance, and that they have charge of the proceedings of the meeting next following instead of that current with or rather preceding their appointment.

Sixth. We recommend that the printing of our proceedings be let to the lowest reliable bidder, and that our veterinary journals be included among those permitted to submit estimates; that the contract be entered into for five years, and that the proceedings are to be printed, bound, and ready for mailing within thirty days after receiving manuscript from Publication Committee.

Seventh. If a veterinary journal be the successful bidder, it may, at its discretion, publish any part of the proceedings as an integral part of such journal; but such matter shall not appear in such journal until the complete proceedings are printed, bound, and delivered to the Association.

Another plan to which your committee would not object is the publication of our proceedings in parts as supplements to the contracting

journal, the supplements to be successively paged in such a manner that the recipient may bind and retain these in separate form.

Our object in recommending such a plan is to permit the successful journal to secure substantial benefit from its contract by becoming in a sense the organ of the United States Veterinary Medical Association, without, however, giving them any copyright privileges in our proceedings, but sufficient and equitable rights which may enable the journal to furnish us with our TRANSACTIONS at a nominal cost, and yet preserve the honor and dignity of our society and preserve to our membership and profession the usefulness of our papers.

In conformity with these recommendations we have asked several printers and our three journals to submit estimates for the publication of our proceedings, but unfortunately this matter has not been completed, and the desired estimates are not at hand. We can, therefore, merely request an expression of your approval or disapproval of the plan proposed and defer final action pending the receipt of estimates.

W. L. WILLIAMS, Chairman,
S. STEWART, Secretary,
N. P. HINKLEY,
Committee.

DISCUSSION.

Dr. Bell: I have listened with a great deal of attention and interest. Representing one of the journals to which the gentleman referred, I can appreciate the fact that the publication of the report cannot be done without funds, and that his effort to accomplish this at the lowest expenditure is a most laudable undertaking. As he states, our journal received an invitation to make an estimate upon printing the proceedings, with the idea that a full publication in a journal could be preserved for duplication in the report, making it as inexpensive as possible. The communication was received too late to make an intelligent estimate, but I have since assured the chairman that we would submit one. I am quite sure that this is the best method out of the somewhat embarrassing position, because a single composition of the proceedings to be used for two purposes is certainly an economy. It is a little embarrassing to the journals, however, that they are required not to use any of the proceedings in their publications until after it has been bound for delivery to the members. The enterprise exhibited by the various journals at present requires them to be out a little more up to date than that, and by wriggling around that little difficulty I think a conclusion can be reached. Probably the President has some suggestions to make.

The President: I have nothing further to say. The only way I was ever able to get a report was to take it to a good printer. I do feel that it is rather an injustice to the effort of journalism to exclude them from

the use of material. At the same time, as one connected with one of the journals, I propose to join with the members of this Association in adopting whatever plan is feasible, and then the journals after that can take care of themselves, to secure whatever they need by other methods, honorable, but perhaps more expensive.

Dr. Williams: So far as the committee is concerned I beg to answer the editor of the *Journal*, in that we have no idea of crippling the journals. They have a perfect right to come into this Association, and I presume they can employ a stenographer and get these papers. The chairman of the committee last year furnished his paper to three different journals, and it was published in pieces, and by the time that paper got around it was rather dry reading for him. It is almost a disgrace to our profession to see these journals picking up a paper and publishing it without the discussions appearing in connection with it. If the discussion comes out at all, it is in a detached way. The papers should come before the profession to the very best advantage possible. This committee does not enjoin any journal from putting all these papers in their columns at such times as are proper. I regret very much this matter is not taken up with a little more interest by the members of the Association. It is of great importance to the well-being of our Association that this matter should be taken up and discussed. There is one thing in particular on the question that I did not mention, that is, that practically all our previous reports were published in full; now, had all these been published by one journal it would have been a matter of pure economy, because we could have had reprints for this Association properly paged, and it would simply be the expense of the press-work, the paper, and repaging, and then the printing of the abstract of our discussion and executive acts would have been a light task. If the journals desire to retain this matter as a part of their regular work, why should we not arrange in some way by which we can have good, convenient records of our Association which shall be intelligible and dignified?

Dr. Cary: I think there is a difficulty in the way here that would be somewhat embarrassing both for the journals and the Association. As I understand the committee's report, this should be gotten out in complete form before they were allowed to publish it. Now, the question is whether they want to do that. My own opinion is that the competition of printers would be better than the competition of three journals. I think we would get a better rate. I do not think if the journal is compelled to print this, after it has been produced in book form, it can be of much advantage as a secondary matter; therefore, I think the best competition we can get is through the printers, without having one journal fighting the other.

I move that the matter of letting the printing be left as it is, with the

Publication Committee, and that the Publication Committee be requested to get this report out within sixty days after the meeting, and that no journal be allowed to take the material or any paper without taking the discussion with it prior to the publication of the report.

Dr. Osgood: It seems to me you might just as well take up a subscription here of what each individual would have to pay to secure a copy.

Dr. Salmon: I was going to suggest that the proceedings be printed by subscription, and that each member who would wish a copy of it could obtain it by paying twenty-five cents for the number, which would probably bring the amount referred to to a sufficient sum to pay for it, and the deficiency, if there should be one, might be made up from the treasury and a contract given to the lowest bidder.

The President: The suggestion of a subscription plan cannot be adopted. We tax our members $5 a year, with the idea of giving to each a copy of the yearly proceedings; that was the object of increasing their dues. I know of no better plan than leaving it in the hands of those who have given it so much consideration, and it is not wise to place too many restrictions on that committee.

Dr. Howard: I move, as an amendment to the original motion, that the whole matter be left to the Publication Committee, with power to act.

REPORT OF THE COMMITTEE ON DISEASES.

The committee on the subject, "Diseases," can be made to perform important functions. We found however, considerable difficulty in determining the nature of the work to be treated in this report. Excellent material would be offered by studying recent clinical and pathological observations upon the various diseases, new methods of treatment, new agents, such as tuberculin, mallein, and antitetanin, control work in eradicating and restricting diseases, etc. These, however, are more suitable for original articles than committee reports, unless it be a special report, and we have followed the routine in ascertaining the prevalence, peculiarities, and incidental facts of the diseases throughout the United States. Printed circulars were sent to about 600 veterinarians. Their replies were abstracted so as not to make them too voluminous. To these veterinarians the committee extends its obligations.

The special subjects spoken of above will doubtless be discussed by the Association at another time.

Alabama. Tuberculosis is prevalent, especially in old-established dairies. No definite percentage. Tetanus very frequent from wounds of the extremities. Influenza rare. Infectious pleuro-pneumonia, believed to be identical with "brustseuche" of the Germans in green horses, is common; the mortality is high, due to abscess of the lungs. Glanders, no outbreaks; few sporadic cases. Strangles, not frequent. Texas-fever, one suspected case. Osteoporosis frequent in young horses. Mange, scarcely a dog without it; good results from creolin and lard. Canine distemper. Epizoötic.

REPORT OF C. A. CARY TO CHAIRMAN HARGER OF THE COMMITTEE ON DISEASES OF THE U. S. V. M. A.

During the time of the year when heavy dews are on the pastures we have a disease which does not seem to exist in the North, and I do not think it is touched upon in any of the text-books. It is popularly known as "foot evil," and is caused by what people call dew poison. It seems to be a very acute inflammation of the skin, starting generally in the hollow between the bulbs of the heel and rapidly extending round the skin surrounding the coronet, with shedding of the hoof as a frequent result. I have never been able to get at the exact nature of the

cause, but I am of the opinion it is produced by the acrid or irritant property of some species of grass or herbs, dissolved or suspended in the dew. It is local, and appears to be popular to some pastures, or parts of a pasture.

The disease can be prevented by anointing the coronet with any oleaginous material before turning the animals to pasture.

FARGO, N. D., July 17, 1896.

DR. SIMON J. J. HARGER, Chairman of Committee on Diseases.

DEAR SIR: As per request and as a member of the committee of which you are chairman, I will present a few facts relative to the varying conditions and post-mortem appearances found in animals suffering from tuberculosis.

In holding post-mortem examinations on animals which I had destroyed for tuberculosis in this State I have been very much impressed with the difference in location and appearance of the disease as compared with the location and appearance of the same disease in animals in the Eastern and Middle States—Michigan and Indiana especially. While a resident of these two States I held a number of post-mortem examinations on cases which had been destroyed for tuberculosis, and in all but a single case the lesions were found in the lungs, showing the characteristic appearance of the lung form. In the case which was the exception of this rule the lesions were found in the intestinal tract, and were well marked. Tumors of caseous matter, weighing from a few ounces to three pounds, were present.

During the year 1895 and thus far in 1896 I have tested the following herds:

No. 1. Eleven animals, nine tuberculous.
No. 2. Eighteen animals, one tuberculous.
No. 3. Seven animals, six tuberculous.
No. 4. Thirteen animals, seven tuberculous.
No. 5. One animal, not tuberculous.
No. 6. One animal, not tuberculous.
No. 7. Eight animals, none tuberculous.
No. 8. Nine animals, two tuberculous.
No. 9. Four animals, three tuberculous.
No. 10. Twelve animals, none tuberculous.
No. 11. Sixteen animals, two tuberculous.

I held post-mortem examinations on every animal that showed tuberculosis. Of the nine tuberculous animals in Herd No. 1, seven showed tuberculous lesions in the intestines, one was glandular tuberculosis, and the ninth had affected lungs.

Herd No. 2. Tuberculosis of the intestines.

Herd No. 3. Five had tuberculosis of the intestines, one of the lungs.

Herd No. 4. Five had tuberculosis of the intestines, one of the glands, one of the lungs.

Herd No. 8. Had tuberculosis of the intestines.

Herd No. 9. Three of the animals had tuberculosis of the intestines.

Herd No. 11. One of the animals had tuberculosis of the intestines; the other animals have not been destroyed, but are being kept for experimental purposes.

The tuberculous animal in Herd No. 2 had well-marked tuberculous lesions of the intestinal tract. The animal that was destroyed in Herd No. 11 was a two-year-old steer from the short-horn cow destroyed in Herd No. 2. Post-mortem examination on the steer showed lesions of the intestinal tract identical with the lesions of the parent.

Granting that the cow, which is still alive, but yielded to the test for tuberculosis, is suffering from the lung form, we would have twenty-four cases of intestinal tuberculosis out of a total of thirty cases affected, leaving six cases where the lungs were the seat of the disease. On a percentage basis this would give 80 per cent. of the animals destroyed affected with intestinal tuberculosis and $13\frac{1}{3}$ per cent. of tuberculosis of the lungs, and $6\frac{2}{3}$ per cent. of the glandular tuberculosis.

Herds No. 1 and 4 had previously suffered a loss from this disease, and on post-mortem the true condition was verified. If we were to examine all the herds in the State we undoubtedly would find that the percentage was very much under this, probably would not be more than 6 or 8 per cent.

I would like to call attention to the history of Herds No. 1 and No. 4. They originally constituted a single herd. During the last ten years previous to the test twenty head died of symptoms identical with those of tuberculosis. A post-mortem was held on several of this number, and in every instance was the presence of tuberculosis visible. During the last two years previous to the test the death-rate was much more rapid; in fact, so rapid that the increase of stock merely kept pace with the number of deaths, and the herd did not increase in numbers.

With regard to the breed of cattle represented in this test, will say that we examined of the Short-horn breed, pure bred and grades; Holstein, pure bred and grades; Jerseys, pure bred and grades; and grade Polled Angus, and found diseased animals among each breed mentioned. It has been definitely demonstrated by experiment that the disease is transmissible from one animal to another, and through the medium of the milk to other animals.

Connecticut. Tuberculosis general. Of 2235 cows tested with tuberculin, 375 had tuberculosis. Of 596 tested by Dr. R. P. Lyman, 138 were tuberculous. Tuberculin never failed. Surroundings variable.

Fifty horses cerebro-spinal meningitis; one epizoötic.

Tetanus here and there. Severe case recovered with antitoxin.

Verminous bronchitis: One flock.

Hog-cholera: Considerable. Government "prescription" with fair results.

Anthrax: None.

Actinomycosis: Lesions of tuberculosis and actinomycosis in same cow.

Hydrophobia: One(?).

CALIFORNIA. The following diseases are very prevalent in this State: Tuberculosis, hog cholera, black-leg, glanders and farcy, variola in sheep, Texas-fever, influenza, and strangles.

The following diseases exist in the State, but are not very prevalent: Trichinosis, cerebro-spinal meningitis, tetanus, anthrax, actinomycosis, and osteoporosis.

Tuberculosis is very prevalent throughout the State. Some herds of dairy cows that have been subjected to the tuberculin-test have shown 70 to 75 per cent. of them to be affected. Tuberculosis is also very prevalent among hogs raised and fattened on milk, or, as they are called here, dairy or milk hogs.

Texas-fever is very prevalent in the southern portion of the State, the northern portion being comparatively free from it..

Glanders and farcy is not as prevalent as it is in some of the Eastern States, but as there is nothing done to control this disease, it is steadily on the increase.

Hog-cholera is very prevalent in certain portions of the State, and it is steadily spreading through neglect.

ILLINOIS. The usual diseases exist.

Tetanus. Dr. J. F. Ryan mentions three cases in one stable within a month; in another seven cases. This stable averages from five to fourteen cases yearly. The ground around the stable was made ground (street sweepings, etc.), and is believed to be the source of infection.

Dr. M. R. Trumbower writes as follows:

August, 1895, to July 31, 1896. Inspection at the Union Stock-yards in Chicago for actinomycosis 9190 cattle, of this number 6415 passed into the yards and were sold; 2775 were so badly diseased that they were held for post-mortem inspection at the time of slaughter; of this number 985 passed post-mortem inspection, and 1790 were condemned and cast into the rendering tank; 22 were condemned for being affected with cancer; 64 for being tuberculous; 5 that were excessively bruised; 1 for gangerous ulceration; 4 for being in an advanced stage of pregnancy; 19 were condemned for excessive emaciation. During the same period of time, August 1, 1895, to July 31, 1896, we condemned and destroyed 235 horses affected with glanders, at a total cost for animals, burial, and disinfection of premises of $2453, being an average of $10.44 per head. During the year 7 horses died with cerebro-spinal

meningitis, and 2 were destroyed, together with a barn, at a cost of $275. Of the number of cattle that we tested for tuberculosis (653 head), we found $13\frac{6}{10}$ per cent. diseased, all of which were destroyed, and post-mortem observation recorded, with a result that we made only two mistakes.

We have no contagious pleuro-pneumonia in this State among horses or cattle. It is difficult to state what amount of trichinosis exists among swine. The Government inspectors find from 2 to $3\frac{1}{2}$ per cent. at the large packing houses in Chicago, but the number of these that are raised in this State it is impossible to state. Tetanus appears to become a little more prevalent each successive year. Verminous bronchitis in either cattle or sheep has been discovered in only two instances during the year. Hog-cholera was very prevalent last fall and during the winter, entailing a very serious loss in the communities where it prevailed. Only three cases of anthrax were discovered during the year. Influenza is not as prevalent as it has been during former years. Strangles in the southern part of this State seemed very serious.

South Dakota. Usual diseases exist. Several outbreaks of black-leg.

Dr. S. M. Smith writes that in about 300 cases of actinomycosis iodide of potassium was always successful when the bone was not affected or the tumor not too large.

Anthrax and splenic apoplexy plentiful.

"South Dakota has a very modifying effect on many diseases which assume the acute type at a lower level. Markedly so glanders, which seems almost non-contagious as well as curable, while influenza here is almost always of a mild type and easily amenable to ordinary remedies. Pneumonia is very seldom seen here except from overdriving or traumatism. In twelve years I have not seen six cases of pneumonia, bronchitis, or pleurisy."

Kansas. Usual diseases. Hog-cholera prevalent. A tablespoonful of cotton-seed meal in the feed has been found to be a good preventive (Harrison). Dr. R. H. Harrison writes:

"I desire to report progress in the operation of periodic ophthalmia (paracentesis of the anterior chamber). Have operated upon 50 cases since the meeting at Chicago, and 45 of the cases have recovered. This increased percentage is due to a more careful selection of cases submitted; questionable ones were refused treatment by operation. Some time since I read a paper before the Missouri Valley Veterinary Medical Association, subject 'Parturient Apoplexy.' Cases were treated with a solution of salt and water, 1 per cent., temperature 100°, an injection of a pint being made into the circulation by intra-jugular injection. The treatment was very succesful for the first 30 cases, but has failed very badly since.

"After careful study and thought I cannot accept the opinion of late writers that this disease is due to septic poisoning from ptomaïnes."

Iowa. Usual diseases. Actinomycosis and hog-cholera prevalent.

Of the treatment of "choke" in horses, Dr. G. A. Johnson writes: "This treatment consists in inserting a trocar and canula (one-eighth inch in diameter) into the obstructing mass within the œsophagus. By catching hold of the obstruction, œsophagus, and external tissues, one can hold the mass quite firmly, and by working the trocar and canula (having the trochar into the canula only far enough, so that the point is covered) backward, forward, and sideways, break up the mass. One case was the result of swallowing a potato and the other soft food; in both cases passing the probang caused such coughing that it had to be removed; but by the use of the trocar and canula the mass was easily broken down, and the cases made an early and uneventful recovery."

Louisiana. Tuberculosis. This disease must be very prevalent. Around the city of New Orleans Dr. W. S. Wheeler found 48 per cent. of the cows tuberculous. Tetanus is common. Also actinomycosis.

The strongylus ovis pulmonalis in sheep, pulmonary distomatosis in the hog, sheep, and steer, and the strongylus paradoxus, especially in young hogs, are very common.

Ulcerative stomatitis. Liver-fluke common.

Osteoporosis common in the horses under good hygienic conditions as to stable, food, and water.

Glanders: Sixteen horses and mules tested with mallein. Four reacted and were found glandered.

"In one case which I inoculated the temperature rose to 105°, being normal before, and in the course of three or four days characteristic ulcers developed. The fever disappeared on the third day after inoculation, but chancres and ulcers progressed and healed in about five weeks, when every trace of the disease disappeared, and the animal was put to work in apparently perfect health, and has remained so since."

An Unclassified Disease. In August, 1893, an outbreak of a very fatal and curious disease occurred about twenty miles from New Orleans on a sugar plantation. From June 1st to August 15th about twenty mules died; in fact, all that were sick succumbed.

Symptoms. The first symptom was a high temperature, 105° to 107° F. The pulse was from 85 to 100. Absolutely nothing abnormal in respiration until just before death; in fact, the general appearance of the animal showed nothing wrong, and the only way one could detect that an animal was ailing was by means of the clinical thermometer; the pulse, appetite, and excretion remained normal.

The course of the disease was from three days to a week. Just before death muscular tremors came on, and after a brief struggle death took place.

Post-mortem. I cut open seven mules, and invariably found the same condition, namely, an enormous gelatinous or serous infiltration of the walls of the large colon. This infiltration was a clear amber, and there was not a trace of any inflammation, nor did the appetite or manner justify one to expect such to be the case.

Another invariable condition was the presence of from 10 to 50 filaria equina in the abdominal cavity. Whether these latter had anything to do with the condition of the colon I cannot say.

Every other organ was absolutely normal in appearance, including the spleen, from which microscopic preparations were made, and no charbon found. I might state here that the presence of this filaria is quite common in this section of the country, especially in stock living in the country, but I have never seen as many as in these mules. There was considerable serum also in the abdominal cavity itself. I have hoped to have a chance to see another outbreak of a similar kind in order to make a more careful study of the subject, but thus far my patience has gone unrewarded, which is the excuse I offer for the above crude recital. There had been charbon on this same plantation in 1888.

Mycotic cerebritis frequent.

Massachusetts. The Board of Cattle Commissioners of the State of Massachusetts have tested with tuberculin 33,120 cattle within the borders of the Commonwealth since October 15, 1894, of which 7008 reacted to the test and were destroyed. They have also admitted into the Commonwealth 21,269 cattle upon the tuberculin-test; reports have been received of 440 horses suspected of glanders since December 15, 1895, all of which have been examined, and 370 condemned and destroyed. During the same period of time, from December 15, 1895, to date, 115 outbreaks of hog-cholera have been reported within the State. In October last it came to the knowledge of this board, through the public prints, that there were indications that rabies had broken out among dogs in a portion of the State. Upon this uncertain information the board made an examination into the matter, and found that the reports were true, although the number of affected animals up to that time had been only two or three.

It should be stated in this connection that it has been very hard for the board to get any actual reports of these suspected cases; the procedure has been that whenever a report indicating that a suspicious dog had been killed in any neighborhood to send to the authorities in that neighborhood, asking them to, if possible procure, the carcass of the suspected animal and send it to them. Almost all of the cases herein specified have been a result of these reports made, in the first instance, in the newspapers under "general news." This will account largely for the fact that a number of the carcasses have been in an unsatisfactory condition for examination when received. It also seems proper

to add in this connection that within our personal knowledge there have been two other outbreaks of rabies within the borders of this State, and that all of them continued to exist for something like a year and a half before becoming extinct. In this outbreak all of the trouble seems to have been limited to a period of something over three months. The board feels that it is only fair to presume that this very much-shortened period is due to the active measures taken by it in ordering that all dogs within the infected area be muzzled for a period of ninety days, and compelled the execution of this order against a bitter opposition.

MONTANA. Tuberculosis rare. Not known among range cattle.

Cerebro-spinal meningitis occurs in regions where there is no surface decomposition, the soil being irrigated from the mountain springs and snow.

Contagious diseases rare.

Parasitic diseases are common, sheep suffering most, owing to the large herds in which they are kept and constant ranging and corralling on the same ground. The most destructive of these is fimbriata of the liver of sheep, affecting most seriously lambs at four to twelve months. Œstrus ovis causes some fatality and considerable loss of condition.

The micro-parasite causing ictero-hæmaturia of sheep has been described in Bulletin No. 8, Montana Experiment Station.

Horses are affected by strongylus armatus, tænia, œstrus equi, and a long list of intestinal worms. But the first two seem the only ones of very great importance. The so-called "range disease" of horses is highly prevalent in some sections at times, but have not seen it personally. It causes fearful losses at times, taking 25 to 50 per cent. of large bands of horses. The affection has not been studied, but from the symptoms given it appears possible that it is similar to or identical with the surra of British India.

In fowls the cytodites nudus or air-sac mite is apparently universally distributed in this State, and exists in Idaho, and, while several foreign authors state it does not cause loss, it amounts here to a very serious scourge to poultry.

Glanders is very mild on the range, feebly transmissible and tending strongly to spontaneous recovery. In valley stables, where horses are poorly housed and kept, the disease assumes its ordinary clinical phenomena and transmissibility, its virulence remitting again when turned on the range.

MINNESOTA. Malignant catarrh of ox prevalent. Other usual diseases.

NEBRASKA. Usual diseases.

Cornstalk disease is reported. Dr. Schaefer, of Burt County, reports the mortality to be very large. He states in his letter that he is positive that the county lost over 300 head, and if an accurate account had

been kept that this number might have been doubled. He believes the farmers ought not to turn their cows into the cornfield unless they have been fed some grain and well watered.

Hog-cholera raging all the year round on the Missouri bottoms.

New Hampshire. Usual diseases.

New Jersey. Tuberculosis about 5 per cent.

Tetanus in a cow following parturition (killed).

New York. Tuberculosis: As to this disease in this State, very little has been done during the past year. A bill for an appropriation to eradicate tuberculosis in cattle failed to pass during the last legislative session. The city health department, however, has begun testing cows within the city limits (numbering about 3500) with tuberculin; they also passed an ordinance requiring all milk-sellers to take out licenses. I can report only good and positive results from the use of tuberculin.

Tetanus: During the past year I have noticed about thirty cases of this disease, in six of which the symptoms were localized in the foreleg, following the introduction of a needle into the side affected. I treated nearly all of these cases with large doses of antitetanin, which resulted in the recovery of five cases where the symptoms were general, and four of local tetanus.

I have demonstrated the value of antitetanin as an immunizing agent, and commend its use as a preventive.

Influenza: This disease has been rather scarce of late, compared with its prevalence during the past five years; the scarcity, in my mind, being due to the enforcement by the health department of excellent sanitary laws and the business depression, making the work of the horses light.

Glanders and farcy: During the past year about 500 cases of this disease were reported. Under the laws of this State glandered horses are condemned, appraised, and paid for, but the appropriation set aside for this purpose was used up last May, when the appraiser was dismissed and payments stopped. Since then there has been a great falling off in the number reported. We continue to use mallein as a diagnostic agent with gratifying results.

Dr. Ackerman tested 58 cases of glanders with mallein; 36 reacted of these, and 16 showed no external symptoms. Glanderous lesions were found in all.

Dr. William B. Kelley extols elaterium hypodermatically and veratrum viride internally in parturient apoplexy.

Pennsylvania. Usual diseases.

Epizoötics of rabies in the western part of the State. Tuberculosis prevalent.

Virginia. Tuberculosis very prevalent. Dr. A. J. Burkholder has

found with the tuberculin-test 33 per cent. of dairy cattle and 10 per cent. of all cattle tested.

From the above certain general facts may be deduced:

1. Tuberculosis appears to be the most widespread disease, existing in every State reported, but is less prevalent on the ranches of the West than in the dairy and farming district. The proportion of animals affected is variable, about 5 to 10 per cent., and the disease can only be accurately diagnosticated with tuberculin.

2. During the past year the remaining contagious diseases have fluctuated but little, excepting certain local outbreaks which make their appearance here and there periodically.

3. In general, they appeared to occur less frequently, due to the enactment of sanitary measures, better qualified veterinarians, as well as the education of the public.

4. The iodide of potash treatment of actinomycosis has given general satisfaction to those who mention it.

The committee would also encourage the sanitary measures and stamping out of disease now being accomplished by commissions, sanitary boards, State and private veterinarians; and every member of the profession owes his share of support in this work.

For information in this report the committee is indebted to James McDonough, Montclair, N. J.; A. J. Burkholder, Staunton, Va.; Dr. D. E. Salmon, Washington, D. C.; R. W. Hickman, N. Y.; J. A. Waugh, Allegheny, Pa.; W. L. Zuill, Philadelphia, Pa.; W. H. Hoskins, Philadelphia, Pa.; C. C. McLean, Meadville, Pa.; J. C. Meyer, Sr., Cincinnati, Ohio; W. B. Kelly, Patchogue, N. Y.; J. A. Bell, Watertown, N. Y.; W. Huff, Rome, N. Y.; E. B. Ackerman, Brooklyn, N. Y.; H. D. Gill, N. Y.; J. H. Hollingsworth, Utica, N. Y.; J. Miller, East St. Louis, Ill.; C. Burden, N. Y.; C. Henry Doepel, Mamaroneck, N. Y.; W. L. Kille, Woodstown, N. Y.; A. T. Peters, Lincoln, Neb.; J. Hall, Falls City, Neb.; W. D. Hammond, Wayne, Neb.; A. Youngberg, Lake Park, Minn.; J. W. Adamson, St. Paul, Minn.; R. H. Bird, Helena, Mont.; W. L. Williams, Bozeman, Mont.; W. H. Dalrymple, Baton Rouge, La.; A. S. Wheeler, New Orleans, La.; G. A. Johnson, Sioux City, Iowa; George M. Walrod, Storm Lake, Iowa; J. E. Brown, Oskaloosa, Iowa; Huston & Van Es, Mobile, Ala.; Olof Schwarzkopff, Chicago, Ill.; J. F. Ryan, Chicago, Ill.; M. H. Trumbower, Chicago, Ill.; R. A. Archibald, San Francisco, Cal.; R. P. Lyman, Hartford, Conn.; T. A. Donaldson, New London, Conn.; S. M. Smith, Mitchell, S. D.; R. H. Harrison, Atchison, Kan.; M. J. Treacy, Fort Meade, S. D.; J. Graessl, Covington, Ky.; N. S. Mayo, Manhattan, Kan.; T. E. White, Columbia, Mo.; Walter Shaw, Dayton, Ohio; L. E. Willyoung, Buffalo, N. Y.; E. P. Niles, Lynchburg, Va.; Lemuel Pope, Jr., Portsmouth, N. H.; S. B. Nelson, Pull-

man, Wash.; F. H. Osgood, Boston, Mass.; William Jopling, Owosso, Mich.; William Jakeman, Halifax, N. S.

Dr. S. J. J. Harger, Chairman Committee on Diseases:

Dear Doctor: I supposed our President placed me on your committee with the thought that I would contribute something concerning diseases occurring in this Western country. *You* have suggested that I say something about the progress made during the year in the treatment of diseases in English-speaking countries. I beg leave to present the following as a brief discussion of these two topics, considering the latter first:

In glancing over the field covered during the past year I fail to note any particular event indicating marked progress in dealing with diseases, but in the main we have marched steadily onward. As in the recent past, our advancement has been mainly along the line of preventive medicine. Protective inoculation is being more extensively practised, and the importance of sanitary science and police is becoming everywhere better understood. This last is true of the people at large as well as veterinarians. The owner of the animal is now recognizing that prevention as well as a cure is desirable, and it is pleasant to note that the veterinarians of the near future will be better fitted than those of the past to recommend the use of preventive measures. Is it not largely the veterinarian's fault, or more properly the fault of his college, that this advancement has not occurred before? We think it is. Not being able to deal with this question of sanitary science and police, his advice has consequently not been asked. By being able to deal with this question he will invite consideration and do much to enlighten his community regarding the importance of sanitation, and will prevent the loss of valuable animals by being largely instrumental in preventing the appearance of disease and in restricting its spread when appearing.

In our own country the subject of bovine tuberculosis has continued to receive much attention, with the result that our former good opinions of the value of tuberculin have been more than confirmed, for the preparation promises to become a curative as well as a diagnostic agent. No doubt now exists but that by its use the disease can be eradicated from our herds without injury to the unaffected. This result has been shown by our work in Iowa and that performed elsewhere by others. As the work progresses it is noted by all who are carefully studying the question that the disease is not, as a rule—in fact, is very rarely—directly inherited. This has raised the question of the advisability of keeping valuable cows slightly affected for breeding purposes, and in the opinion of many they could be kept under proper conditions; the cow that may represent years of painstaking breeding may continue for

some time a source of profit to the owner, and the valuable qualities that have been secured at the expense of time and money be retained.

The value of tuberculin as a curative agent has not as yet been definitely ascertained, but the fact that after several injections the slightly affected animal may cease to react goes to show that at least a temporary cure has resulted. If not of value in curing mild tuberculosis, we may learn that injections before exposure to the disease will produce immunity.

It is pleasing to note that opposition to the use of tuberculin is fast dying out in all sections of the country; that control work has been much extended during the year; and that the agricultural press has ceased to decry its use. Let the good work go on until the work so auspiciously begun in some States is instituted in all cattle-growing countries.

The cattle-tick of the South, the conveyor of Texas-fever, has been studied until it has been announced that a dip of cotton-seed oil will destroy it on infected animals. This being true, the problem of safely bringing Southern cattle North has been solved.

Louping ill of sheep, so prevalent in England, is announced by recent investigators to be (like Texas-fever) intimately associated with ticks. This gives the clue to preventive treatment. The tsetse fly disease of Africa has been found to be due to a hæmatozoön similar if not identical with the surra of India, and it would seem that organisms of this class may have much to do with the causation of disease, for an affection similar or identical with Texas-fever has lately been reported in Queensland, Australia.

The serum-therapy treatment of disease has made progress during the year. For some affections it has more firmly established its merits, while for the treatment of tetanus it promises to act more effectively as a preventive than as a curative agent. Serum-therapy will, no doubt, in time become an important factor in the prevention and cure of many of the now common affections.

In the treatment of sporadic diseases we are constantly learning new facts. Many recent experiments with barium chloride have shown this drug to be a valuable acquisition to the list of colic preparations. Trikresol, a cresol preparation, has proven valuable in the treatment of mange. Our list of disinfectants has grown, and other new drugs have been added to the list of therapeutical agents which I will not pause to mention.

Concerning animal diseases met with in the Western half of the United States much might be written; but I shall attempt the consideration of a few points only. All are aware that tuberculosis, once supposed rare, has been found widespread and very prevalent in some sections. A study of the history of the disease in the West shows that

breeding herds, both East and West, have been largely accountable for its dissemination. No class of animals are exempt, and herds kept under the best of sanitary conditions are often invaded, sometimes a large per cent. of the herd being involved. In a majority of the cases the disease assumes a mild type, and I believe that spontaneous recovery is not rare. Whether this apparent recovery is temporary or permanent, we cannot say. The termination of these mild cases remains to be learned. The question is an important one.

As previously reported by Western veterinarians, glanders is met with in all sections of the West, and while not as prevalent as formerly, cases are by no means rare. I fully agree with Dr. Williams when he says the disease assumes a mild type, sometimes ending in recovery. In my opinion a mallein-test of an infected herd would show many cases of glanders not discernible without the test, and I believe it is these mild cases that serve to keep the disease from being eradicated. They are moved from place to place, and when subject to bad usage the disease develops and a new outbreak is started. The testing of all exposed animals and injections of mallein in mild cases for the curative effect seem desirable.

Hog-cholera and swine-plague are yearly scourges in the swine-producing States, in some seasons causing enormous losses. Time has shown that these affections should be prevented rather than cured, but, considering the time that literature on these diseases setting forth their causes and the necessary preventive measures has been circulated, it is surprising how few swine raisers attempt to carry out any sanitary regulations. During the past year or two, however, many are beginning to realize that the disease must be prevented, and should the States or general government inaugurate a system of sanitary science and police the breeders would now heartily co-operate in the work.

In addition to the diseases common to the Eastern United States, a number of other affections have been described and studied to a limited extent. Not long ago we read of a disease of horses in Wisconsin supposed by one authority to be caused by eating golden rod, and by a recent essayist to be identical with surra in India. The State veterinarian of Montana describes a disease apparently identical with that in Wisconsin, and in this State I have seen one similar case. In this case the blood was carefully examined, but no parasite could be detected. So far the exciting cause of the disease has not been discovered, and the identity or non-identity with any known disease remains unsolved.

The etiology of "cornstalk" disease of cattle, a disease which, if not peculiar to the West, most extensively prevails here, so far remains a mystery. In some years the disease is frequently heard of in November and December, and again in other years the trouble is rarely reported. The many theories advanced as to its cause are all open to objections.

At the present state of our knowledge it seems most probable that the cause is some poisonous agent in the corn-plant.

In a paper before the Iowa Academy of Sciences, in 1892, I called attention to a cattle disease of rather frequent occurrence in Iowa and also reported from Nebraska. This affection has been diagnosticated as rabies, pseudo-rabies, cerebro-meningitis, enteritis, impaction of the third stomach, and by Billings as summer septicæmia. In 1891 and 1892 the disease occurred frequently in Iowa, but since that time outbreaks have been infrequent. The disease runs a lingering course in the herd, extending over several weeks or a few months. It is uniformly fatal; the loss may be small or reach 50 per cent. of the herd. The symptoms are very uniform, and in many respects correspond to those of rabies as described by Fleming. In the paper mentioned these were described as follows: "At first the animal appears uneasy, is alert, takes more notice than common of everything taking place about it, is very attentive if a strange man or dog appears, and a slight switching of the tail is often observed. The eyes soon become staring and wild, and eventually reddened. The animal early refuses food and drink, and as a consequence becomes very gaunt in appearance. Early in the course of the disease saliva dribbles from the mouth, and continues to do so to a greater or less extent until death occurs. Soon after the appearance of the first symptoms the animal begins to bellow or low very much like an animal lost from its fellows. This is continued with intermissions of quiet until the animal dies, and is the most characteristic feature of the disease. Some become quite 'mad' or furious, and chase anything that comes in their way, man as well as beast; many have been reported to me as having chased their attendants, and I have myself been charged at by a steer which at first sight appeared to be inoffensive. At other times the sick animal has a desire to follow one about —to start after and follow other cattle in the herd without any desire to injure them. Within a short time after the first symptoms appear the animal shows weakness in the hind limbs, with a tendency to knuckle over at the fetlocks. This is also often seen in the fore extremities, and as the disease advances becomes more marked, until in some cases the animal will when trotting along suddenly go down by first going over on the fetlocks and then down on the knees, chest, and abdomen. The animal will get up perhaps to repeat the act shortly. This, I think, is due to a loss of the co-ordination powers more than to weakness. In many cases during the trouble severe straining occurs, as if the animal were trying to pass dry feces. Nothing except a small quantity of dark feces is passed, however."

Post-mortem examination shows almost uniformly an absence of what are usually called fatal lesions. Aside from a collection of serum in the subarachnoid space and marked congestion of the vessels of the brain, very few changes are noticed.

The histories of these outbreaks differ. In some instances the animals have been supposed to be bitten by a dog, and in other cases there is no history of a dog in connection with the outbreak. In but few instances is there more than a suspicion of a mad dog. What is the disease, and what is its cause? Is it rabies, communicated to cattle by the bite of some rabid animal? or is it something very similar to it, contracted in some other way? As rabies is very rare in this section in human beings, and truly rabid dogs are seldom seen, it would seem that if the disease is rabies it must be communicated in some other way than by the bite of a dog. Again, when the disease extends over a period of four or five months, it would seem that all could not have been bitten at one time, but that the disease must in some way have been communicated from one to another. Inoculation experiments performed mainly by the Bureau of Animal Industry go to show that at least some of the outbreaks were genuine rabies; this being true of all, I am of the opinion that we have still much to learn regarding rabies in cattle.

Diseases of sheep and swine are very prevalent in certain sections, and are increasing in frequency in proportion to the increase in number of animals kept and the interchange of animals from different herds. Particularly is there an increase in the number of animals affected with parasitism. This result is to be expected, for as the number of herds increase and new pastures become infected more cases would naturally follow.

In the horse, parasitism from the presence of the sclerostoma tetracanthus is now frequent. Some practitioners report considerable loss and much trouble in successfully treating colts affected with this parasite. In the hog, the echinorrynchus gigas, ascaris suilla, and the lungworm are frequently the cause of trouble. The lung-worm is, I believe, of very frequent occurrence; and while it seldom causes death, a severe cough and marked unthriftiness often result. In sheep the loss from parasitic troubles in Iowa during the past two months has by far exceeded that for any previous year. The strongylus contortus is the principal cause of the loss, young lambs being the usual sufferers. In addition to the stomach-worm, the long tapeworm (tænia expansa) is often found, as is also the whipworm (trichocephalus affinis). In some flocks the tapeworm has been the sole cause of trouble. The æsophagostoma columbianum is of frequent occurrence, and I believe is the cause of much loss in winter and spring. So far in this State sheep have been by far the greatest sufferers from parasitic diseases, both external and internal parasitism being common. On the Western sheep ranches the tapeworm causes much loss, and in Montana Dr. Williams has described, under the name of ictero-hæmaturia, a sheep disease not heretofore recognized in this country. Fortunately most of our sheep affections can be cured or prevented.

In addition to the parasitic troubles which I mention as being decidedly on the increase (at least in Iowa), a number of affections of our smaller animals, of which we find no description in veterinary literature, are from time to time reported. For example, we frequently hear from breeders about a disease in young shotes, said to produce more or less lameness, with the appearance of small lumps about the joints or other parts of the limbs. All the reported herds have been described as being fed a variety of food in sufficient quantity, and otherwise well cared for. The symptoms correspond to a considerable extent with those of rhachitis, as given in Zuill's translation, but this disease is not supposed to exist where animals are fed a good nutritive ration. I have not made a personal examination, and do not know what the disease is.

During the past year I have been much impressed with our lack of knowledge of diseases of the smaller domestic animals, and it is very evident to my mind that diseases of these animals have not received the attention they merit, and that we have here a rich field for original work. The diseases of young swine and sheep, especially, should be carefully studied and described; and I am sure that our veterinary colleges are open to censure for not having in the past paid more attention, and some of them at the present time for not paying more attention, to diseases of small animals. Many of our practitioners have to admit an almost entire lack of knowledge of diseases of sheep and swine, a fact which should certainly be remedied in the veterinarian of to-morrow. Diseases of the horse and ox should not receive all the attention of the professor of veterinary medicine.

As soon as veterinarians become competent to deal with the affections under consideration, their practice along these lines will increase and become an important part of the work. Until then we cannot make marked progress in dealing with many of the affections of our small animals. The veterinarian not being informed, the stock-owner is thrown upon his own resources; no intelligent observations are made, and consequently facts which would lead to a better understanding of the necessary preventive and curative measures are gathered slowly.

What I wish particularly to emphasize in this paper is that in this Western country a great variety of diseases prevail, many of which are on the increase, some well understood, and some about which little is known; and that at present, owing to lack of knowledge concerning both diseases of small animals and sanitary science and police, many of them are not being satisfactorily dealt with.

Hoping that this brief and imperfect part of the work of the committee may be of some benefit, I respectfully submit it.

W. B. NILES,
Member of Committee on Diseases.

REPORT OF COMMITTEE ON INTELLIGENCE AND EDUCATION.

To the President and Members of the United States Veterinary Medical Association:

Mr. President and Gentlemen: Your committee has endeavored to deal fairly and in a conservative manner with this subject, knowing that the progress made which is so gratifying to us to-day has been accompanied by a considerable sacrifice on the part of some institutions, and will result probably in the closing of their doors by many of the weaker ones, and we hope and believe the final destruction of those that continue defiant. Notices were sent to eighteen colleges asking for their catalogues. Responses were received from seventeen, and from these the statistics which comprise a part of this report were made up. This is followed by an analysis of the statistics, and finally by the conclusions.

University of the State of New York (American Veterinary College). Governing Faculty: 7 professors, of which number 5 are veterinarians. Adjunct Faculty: 13 members, of which number 10 are veterinarians. Matriculation: That prescribed by the Regents' veterinary student certificate. Curriculum: Three sessions of six months each. Attendance at other veterinary schools allowed in full if accompanied by certificates of successful completion of the year or years, but at least one full course must be taken at this college. Graduates in medicine attend one year. Graduates in pharmacy and graduates of agricultural colleges must attend full time, but allowance is made for studies successfully completed.

Veterinary Department, University of California. Faculty: 10 professors, of which number 5 are veterinarians; 4 special lecturers, of which number none are veterinarians. Matriculation: Examination submitted to in writing, but requirement not stated. Course of Study: Three sessions of six months each. Agricultural college graduates allowed one year's time, provided they pass required examination in first-year studies.

Chicago Veterinary College: 13 professors, of which number 9 are veterinarians; 3 associate professors, of which number 2 are veterinarians. Matriculation: Common-school branches by certificate or examination. Course of Study: Three sessions of six months each.

VETERINARY DEPARTMENT, DETROIT COLLEGE OF MEDICINE. Faculty: 6 professors, 3 of which number are veterinarians. Matriculation: English branches. Course of Study: Two sessions of six months each, with the accompanying announcement that the course will soon be extended to three years.

HARVARD UNIVERSITY. Faculty: 12 professors, of which number 4 are veterinarians; 9 instructors, of which number 5 are veterinarians. Matriculation: English branches, with one of the four following subjects: Latin, French, and German prose, plane geometry or zoölogy. Course of Study: Three years of nine months each. Time allowance to students of other medical or veterinary schools.

INDIANA VETERINARY COLLEGE. Faculty: 10 professors, of which number 7 are veterinarians; 8 lecturers, of which number 3 are veterinarians. Matriculation: Evidence of fair knowledge of the common-school branches. Course of Study: Two sessions, the last of which must be taken in this college.

VETERINARY DEPARTMENT, IOWA STATE COLLEGE. Faculty: 9 professors, of which number 2 are veterinarians; 6 lecturers and demonstrators, of which number 2 are veterinarians. Matriculation: English branches and human physiology. Course of Study: Three years, or six terms of seventeen weeks each. No allowances mentioned.

KANSAS CITY VETERINARY COLLEGE. Faculty: 18 professors, of which number 12 are veterinarians; 4 demonstrators, of which number 2 are veterinarians. Matriculation: English branches required. Course of Study: Three sessions of six months each, beginning in 1896. Time allowance for students of other colleges. Veterinary or medical students admitted to the third year. Graduates in pharmacy and dentistry allowed one year. No allowance mentioned for graduates in agriculture.

MCKILLIP VETERINARY COLLEGE, CHICAGO. Faculty: 10 professors, of which number 5 are veterinarians. Matriculation: Examination agreed upon by the Association of American Veterinary Colleges, or certificates of learning higher than that, or previous admission to a veterinary college having a recognized system of admission. Course of Study: Three sessions of six months each.

VETERINARY DEPARTMENT, MCGILL UNIVERSITY. Faculty: 3 professors, of which number all are veterinarians; 6 associate professors, of which number 1 is a veterinarian; 2 lecturers, neither of which number are veterinarians. Curriculum: Three sessions of six months each. Graduates of medical colleges allowed two years. Graduates of agricultural colleges allowed one year. Allowance for subjects upon presentation of certified class ticket, but right of examination upon those subjects retained by the Faculty. Matriculation: English branches. It is contemplated to add the rudiments of Latin in the near future.

NEW YORK STATE VETERINARY COLLEGE. Faculty: 4 professors,

of which number 2 are veterinarians; 2 assistant professors, of which number 1 is a veterinarian; 2 instructors, of which number neither is a veterinarian; 11 other professors and instructors in Cornell University are catalogued as those "who furnish instruction to veterinary students. Matriculation: That prescribed by the Regents' veterinary student certificate. Course of Study: Three years of nine months each for those who matriculate in 1896, and it is intended in the immediate future to extend the course to four years of nine months each.

Ohio State University (College of Veterinary Medicine). Faculty: 8 professors, of which number 1 is a veterinarian; 4 assistant professors, of which number 2 are veterinarians. Matriculation: Divided into two parts: 1. For applicants for certificate of veterinary surgeon: arithmetic, geography, and grammar. 2. For applicants who intend to become candidates for the degree of doctor of veterinary medicine: 1. Arithmetic, grammar, and descriptive and physical geography. 2. English composition and rhetoric. 3. History. 4. Latin. 5. Physics. No announcement as to requirements for graduates, but that may be inferred from the studies. Course of Study: Three sessions of nine months each.

National Veterinary College, Veterinary Department of Columbia University. Faculty: 11 professors, of which number 7 are veterinarians; 3 lecturers and demonstrators, of which number 1 is a veterinarian; 3 assistant demonstrators, of which number all are veterinarians. Matriculation: English branches. Course of Study: Two sessions of six months each at present, but three sessions of six months each for those who matriculate after June 1, 1896. Graduates in medicine must attend two sessions.

Ontario Veterinary College: 7 professors, of which number 3 are veterinarians; 1 demonstrator, a veterinarian. Matriculation: Satisfactory evidence of good common-school education or submitting to an examination in reading, writing, and spelling. Candidates failing in matriculation examination may proceed with their studies on condition that they pass the examination at any time before the commencement of the second session. Course of Study: Two sessions of six months each. No mention of allowances.

University of the State of New York (New York College of Veterinary Surgeons). Faculty: 9 professors, of which number 4 are veterinarians; 14 lecturers, etc., of which number 8 are veterinarians. Matriculation: That prescribed by the Regents' veterinary student certificate. Course of Instruction: Three sessions of six months each. Graduates in medicine are requested to attend two full sessions. No mention of allowance for graduates in pharmacy.

Veterinary Department, University of Pennsylvania. Faculty: 8 professors, of which number 3 are veterinarians; 9 demonstra-

tors, of which number 7 are veterinarians and 1 a blacksmith. Matriculation: English branches and physics. Course of Study: Three sessions of nine months each. Students of recognized veterinary or medical schools allowed for time, but must pass satisfactory examination on subjects for which they are allowed. Graduates from three-year schools admitted to third year without examination. No allowance mentioned for graduates of agricultural colleges.

United States College of Veterinary Surgeons. Faculty: 10 professors, of which number 5 are veterinarians. Matriculation: That recommended by the Association of Veterinary Faculties of North America. Course of Study: Three session sof six months each. Graduates of veterinary and medical colleges required to attend one year. Time allowance to students of human or comparative medicine from any recognized college or university upon presentation of certificates. Graduates of agricultural colleges allowed for studies pursued, but by inference no time.

Analysis. One school, the Ohio Veterinary College, Cincinnati, Ohio, failed to respond.

Of the seventeen colleges whose catalogues are in the possession of your committee, all but three, the Ontario Veterinary College, the Indiana Veterinary College, and the Detroit Veterinary College, require three sessions of at least six months each; while the New York State College, Iowa State College, the University of Pennsylvania, and the Ohio State College and Harvard University require about nine months to complete a session. Iowa, Pennsylvania, Harvard, and, I believe, the Ohio State College adopted the nine-months' session before the length of the curriculum was agitated in this Association, and therefore deserve especial commendation. The New York State College begins her career with three sessions of nine months each, and proposes in the immediate future to make the course four sessions.

The proportion of veterinarians to the other members of the teaching staff is 5 out of 14 in the University of California; 11 out of 16 in the Chicago Veterinary College; 3 out of 6 in the Detroit School; 10 out of 18 in the Indiana School; 4 out of 15 in the Iowa State College; 14 out of 22 in the Kansas City College; 4 out of 11 in the McGill University; 4 out of 8 in the McKillip Veterinary College; 12 out of 23 in the New York College of Veterinary Surgeons; 3 out of 19 in the New York State Veterinary College; 4 out of 8 in the Ontario Veterinary College; 10 out of 17 in the University of Pennsylvania; 5 out of 10 in the United States College of Veterinary Surgeons; 15 out of 20 in the American Veterinary College; 3 out of 12 in the Ohio State College.

As to matriculation, the Chicago, Detroit, Indiana, Kansas City and Ontario, McGill, Pennsylvania, and California require certificates of

knowledge of or examination in the English branches, some of them specifying reading, writing, and spelling; while one, Ontario, while so specifying, allows those who fail to enter upon their professional studies, provided they pass the examination before the beginning of the second year.

Your committee would like to know how a person who cannot read, write, and spell well enough to pass the entrance examination can profit by the lectures given, and who will have time enough in addition to learn these subjects. Still there is the information, in print, public property. Pennsylvania adds physics, and Iowa adds human physiology, and McGill proposes in the near future to add the rudiments of Latin. McKillip and the United States agree to the recommendation of the Association of Veterinary Faculties of North America in the matter of matriculation, while the three New York Colleges must submit to the Regents' veterinary student certificate, the highest matriculation of any.

The Ohio State College requires a matriculate examination nearly as high as the one required in the New York colleges, and, when we reflect that it is voluntary and not compulsory by State laws, especial credit should be given this institution, but we would inquire what is meant by the class "applicants for a veterinary certificate." This method of certifying to veterinary surgeons as second-class should be condemned so long as any schools use this as a title for all its graduates. The University of Pennsylvania is the only school which expressly requires that veterinarians, candidates for the third year, must be graduates of colleges requiring a three-years' course of study. California and McGill are the only schools which mention time allowance (one year to graduates in agriculture). The New York College of Veterinary Surgeons is an exception to the rule in requiring graduates in medicine to attend two full sessions instead of one—an exception which should be the rule in reciprocation for the treatment that veterinarians receive at the hands of the medical schools. Kansas City allows two years to graduates in pharmacy and dentistry. Many of the schools make no mention of allowances.

Summary. Of the 17 schools heard from, 14 require a three-years' course of study; 4 of them required this before the question was agitated by this Association, one, just established, voluntarily, leaving nine to the credit—are we not right in saying it?—of the earnest efforts of this Association. This is something to be proud of, and while some may be so degenerate as to show no evidence of repentance, still we may hope by constantly extending the right hand of fellowship to gather in the fold all who are healthy enough to live. The percentage of veterinarians to other members of the Faculty is too small in many cases, but better this than the other extreme, where a whole army of veterinarians appear on the staff. Quality rather than quantity all of the time. The

greater the quantity of the teachers, perhaps the more instruction; but the better the quality, certainly the more education. Instruction and education are quite different. The former forces or tries to force facts into one's head, while the latter teaches one how to observe facts intelligently. The former is necessarily resorted to by short-term schools if it expects any results at all, while the latter *should be* the method employed in longer-term, well-equipped schools.

In final conclusion, let me say that two members of your committee and its chairman believe that the matriculation examination is the most important matter that we have to contend with, while a discussion of the standing of professors in some cases might be a little too personal and had better not be agitated in detail at present. I subjoin the reports of Drs. Faust and Baker.

A. W. CLEMENT,
Chairman.

POUGHKEEPSIE, N. Y., August 26, 1896.

DEAR DOCTOR: Allow me to express my views in regard to the adoption of a common standard for matriculation examination. A matter so important, both to the profession and the public, as the education of the physician or veterinarian cannot, it seems to me, be too often rehearsed.

It is within the memory of most of us when mental qualification to pursue the study of medicine was ignored. Anyone possessed of the necessary matriculation fee could become a student of medicine. An attendance on two courses of lectures of from four to five months each, and the passing of a final examination, too often perfunctory, turned him loose on the world to build up a more or less trusting patronage. I do not mean to infer that there were not many institutions which maintained a comparatively high standard, but simply that from the lack of State supervision such were the possibilities.

It is true that the old method has given us many men of undoubted scientific attainments who have not only distinguished themselves, but brought renown to American medicine. Still this is no argument against the inadequacy of the system, for in all ages men have risen above the defective methods of their time, only proving the law of deviation from an average. If it be true that medical instruction should be adapted to the capacity of the student's powers of assimilation, it is a necessary corrollary that the more advanced the student's preliminary education, the more extended the curriculum of the professional course may become. Therefore, is it asking too much that a matriculate should come to the preparation of his life-work with a mental equipment capable of comprehending to the fullest extent the instruction given him?

By the united efforts of the medical profession of the State of New York,

the Legislature of 1889 passed an act providing for the preliminary education of medical and veterinary students. The educational standards established by this law, considered to be equivalent to those required for admission to a high school, had been required of law students for several years. A second advancement was made by the law of 1890 to what was equivalent to the middle of a high-school course; and a third, the present standard, in 1896, the standard of educational requirements preparatory to the study of medicine being advanced to a completed high-school course or an entrance examination to a college of arts.

The amendment of 1896, drafted with the utmost care, while providing an advanced preliminary educational standard, establishes the principle that students entering on the study of medicine shall receive their degrees under the conditions prevailing at the time of beginning the prescribed course of medical study. It further provides for matriculation after 1897 a full four-years' high-school course, or an examination equivalent to the same, as the minimum requirement in the point of preliminary education for the degree of veterinary surgeon or doctor of medicine. This bill provides a uniform standard and meets with general approval.

The laws of 1895 and the amendment of 1896 permit the student to select, from the full group of seventy, three academic branches—any number sufficient to make up a full four-year high-school course; admission to the high school presupposing at least eight years of elementary instruction, twelve years of consecutive study thus constituting the requirements of a preliminary education. The period of twelve years is considered sufficient without requiring particular studies, although any medical institution may demand a higher standard. This minimum is considered by the State to be safe.

Under the present preliminary and professional requirements for license to practise medicine, the development of the New York medical schools is remarkable. Since the Act of 1890 became a law, transferring the right of license from the college to the State, the students in her medical schools have increased from 3321 to 3766. Of still greater significance is the growth from 393 in 1891 to 1460 in 1895, or an increase of nearly 300 per cent. in the number of students holding medical degrees who go to New York for post-graduate work.

The Medical Department of the University of Pennsylvania, the parent school of medicine in this country, dating its growth from 1765, made Philadelphia the medical centre of this country, until New York by legislative enactment and increased hospital facilities took the leadership.

It is easy to establish the fact that the growth of New York medical schools is largely attributed to the stringent laws requiring definite preliminary and professional attainments for license to practise. New York

schools would not have attracted so many students and would have been less productive of good results if the laws administered by the State Board of Medical Examiners had not been adopted.

The requirements in point of preliminary education for license to practise medicine, determined by the Regents of the University of the State of New York, are quite generally recognized as leading inevitably to the adoption of a uniform standard for admission to medical schools throughout the United States.

The adoption of such a uniform standard for admission to our veterinary schools by the Legislatures of the different States as has been adopted by the State of New York, I fully indorse. Our united efforts should be directed to that end.

I will have to forego the pleasure of meeting with the profession at the coming session of the U. S. V. M. A. at Buffalo, on account of the serious illness of Mrs. Faust. Hoping that the coming session may indeed be a very pleasant and profitable one, I remain,

Yours very truly,

JOHN FAUST, V.S.

CHICAGO, August 22, 1896.

DR. A. W. CLEMENT, *Chairman of Committee of Intelligence and Education:*

DEAR DOCTOR: Your postal of the 12th inst. received. I agree with you on the points mentioned. A Board of Examiners I do not think practicable nor advisable, but a general code of examination can be recommended. The standing of professors is a very delicate subject to touch; the welfare of a school would depend upon the standing of its teachers; the solicitude of the trustees for its welfare would induce criticism of the teachers. It would be very presumptuous for any self-appointed authority to dictate to a school who is fit and who is unfit to teach. It could be carried to the extent of recommendation only, and even to that extent it might be looked upon as meddling. A common matriculation examination would be very desirable, and I think feasible. If the U. S. V. M. A. would recommend such an examination I think it would be quite generally adopted. The progress of veterinary science during the last two years has been great, and is a matter for congratulation by all lovers of the profession. You have already been officially notified of the extension of the course of the C. V. C. from two to three years. Yours very truly,

A. H. BAKER.

DISCUSSION.

Dr. Stalker: I am much gratified at the compact manner in which a large amount of very valuable information is brought together in regard to the colleges of our country. It certainly indicates a wholesome growth in the right direction, in that nearly all of the colleges have come to adopt a three-year course. A few of the institutions that were fortunate enough to be independent of funds to begin with adopted this as a measure before it was adopted as a recommendation of this Society. I believed then it was a wise plan, and that ultimately all the colleges would embrace it.

I am pleased to see that there is a conservative spirit manifesting itself, and little of the disposition to dictate to colleges what they must or shall do.

We labor under difficulties, especially those connected with State institutions. In the college I am associated with we have four veterinarians who are members of the Faculty, while our teaching force embraces about fifty people. It is difficult for those four to settle any definite plan as regards requirements for admission and graduation. The Faculty of the institution will take our advice for a good deal on these points, but we not only must settle these things, but we must account to the Board of Regents as well. Anything we may say to them is nothing more than advisory. If we suggest that anybody outside of that body would like to have a word regarding the requirements of admission to that college, they would be likely to say to us that the Society of Civil Engineers had equal claims for making requests in regard to the admission and graduation of students in that particular branch, or that the Society for the Advancement of Science might very properly suggest what would be the proper requirements for admission for a scientific course.

All in all, I believe the country has great cause to congratulate itself on the progress of veterinary education. I belong to several associations of different characters, but there is no class of men with whom I meet that seem to me more thoroughly at home with their facts and more thoroughly imbued with a spirit of the promotion of their interests than are these men. I always go home thinking a little more of myself for having come in contact with these men. And year by year it grows more and shows, as I say, a steady advancement on the educational side of this profession. (Applause.)

Dr. C. P. Lyman: I can only repeat what has been said, and as

stated by Dr. Stalker there has been so much said and so well said. In regard to the requirements for admission—what they shall be—I say, and I think we all say, that if we can in any way establish a uniform requirement of this sort it will be of very great advantage to us.

Dr. Bell: I think we are greatly indebted to the chairman of the committee for his exhaustive report, which gives us a very clear idea of the situation as it is to-day. I congratulate you on the condition of education as it exists this year.

Dr. Gill: The law fixes the entrance examination, and the graduates must undergo an examination before being able to practise in New York. So far as the Faculty controlling this question, they have not all to say; at least they do not have in New York State. The veterinarians in general went to the Legislature and had a bill put through, personally, that regulated the requirements irrespective of any college, and I do not see why this same thing cannot be done in Ohio or Massachusetts as well as in New York. It was through the good offices of the Association that such a condition of affairs was brought about in New York, and we have all felt the benefit of those laws. There is no question but what the quality of the men coming to us is better. As you know, it requires forty-eight counts for a full, four-year high-school course. I do not see why we cannot have a uniform standard, and I think it can be had irrespective of the colleges. I do not think that that question is subservient to their will alone.

Dr. Hughes: The Chicago College has come in line with the three-year course, as it has been our inclination to do for years. I am pleased to see that all the schools are coming to an extension of the course. There are a few still out, and it should be the effort of the Association to endeavor, as far as possible, to get the schools that are outside of the Association's requirements to come in. I am in favor, to the utmost, of a uniform examination among the various colleges.

Dr. Salmon: We think we have always had a good course of instruction at our college, and we have made arrangements for perfecting the course and giving additional facilities by which we hope to place the institution upon a basis which will be satisfactory to all those interested in the profession. The National Veterinary College is now the Veterinary Department of the Columbia University, and is on the same basis as the other departments of other universities referred to. I have not seen any of the difficulties which some of the gentlemen have mentioned, of getting the Board of Regents to agree with the necessary regulations or the establishment of a proper course of study. It appears to me it would be rather an anomalous position for the Board of Regents to take, that they would not accept the recommendations of their veterinary Faculty as to the course which should be pursued regarding the

requirements for admission and graduation. I do not see how any body of men outside of the profession can expect to know about such matters as that, except as they are advised by the special Faculty which does know what is necessary to do and that does know what should be carried out. It appears to me that it is not a question of this Association, nor any other outside board making these recommendations, but it is a question for the Faculty of that particular branch of the university. Of course, we do not say to the Faculty of the University of Iowa that they should put in any particular course; but if an agreement is reached as to what is a proper course, we come back to our institutions, to the Faculty of the institution, and make the recommendation in the proper form. It is not a question of this Association going to the institution and saying what should be done, but it is a question of the recommendation of the particular Faculty, and it seems to me it is an important matter for us to discuss and understand, because as we are scattered throughout the country we do not get an idea of the different requirements in the different institutions except as we come together and someone gives us an analysis of the requirements of the different institutions. It seems to me that the veterinary student at the present time must feel a little confusion when he starts out as an applicant for veterinary practice. There are such differences in the requirements for admission into the institution and such a difference to get out of them, and such a difference of requirements to enable him to practise in different States. A man may graduate at a college which has a sufficiently long course, and the first State he goes to he finds he is obliged to pass another examination; he stops there for a few months, realizing he is not doing as well as might be expected, and he goes to another State, and there he is called upon for another examination; so no matter where he travels, if he crosses a State-line he must expect to pass another examination and take out another license to practise. That condition of affairs makes it necessary that we should try to get a uniform standard so that after a man gets out of college he may be permitted to practise in any State. We ought to have one examination for him to pass to get into practice and have the other States honor it, so that a man will not be required to pass examinations during all his life.

Dr. Williams: I enjoyed the very excellent report of Dr. Clement. There are many things behind which a committee cannot well go, and which interfere to some extent with the value of a report, and I do not know that that is more true with any other committee than it has been with that of Intelligence and Education.

In the announcements of many of the institutions one of the most serious shortcomings is the real significance of the number of instructors composing the Faculty. Some of them have a large number of instructors; many of the members give comparatively little time to the college

work and are satisfied to give a certain number of lectures during the year. There are those men who give from twenty to thirty lectures, and others who give their entire time to instruction. It is a very important matter, however, and one which we should constantly consider in forming our estimate of the value of the Faculties of the various colleges.

On motion, the discussion was closed and the report of the committee received.

PRESIDENT'S ADDRESS.

By W. HORACE HOSKINS, D.V.S.

Fellow-members and Colleagues: This thirty-third annual meeting, at which are present representatives from all sections of our country, will add another page to the history of our Association and forge another link in the chain that marks the growth of our profession in North America. For many years we followed in the lines marked out by veterinarians in the older countries of Europe, and have with keen eyes watched their investigations and their results in order that we might utilize them for the good of our own people. But to-day we note a changed aspect of affairs, and observe with pride the veterinarians of the Old World following the swath we are cutting through the long-neglected and ignored field of veterinary sanitary medicine, thereby making for ourselves a page in history that shall never be effaced, and which in the near future the humblest person will be thankful for. It is under these auspicious conditions, my colleagues, that I welcome you to the deliberations of this convention, toward whose work you have long looked forward with eagerness and pleasure. I ask you all to give the freest expression to your thoughts during the sessions of our convention, and I would impress upon you that this is our Mecca, toward which our annual pilgrimages are made, where we can place our offerings and tributes as tokens of the measure of our appreciation of the responsibilities that our profession has laid upon our shoulders. It is meet to do good at all times, and while our calling may never bring wealth, it can bring to one and all that which is better —happiness, honor, and power to do good. To do good to our fellow-man is the highest and noblest work we can engage in, and he who, in the greed of gain, would debase our efforts in our work of mercy for the relief of the suffering brute is unworthy of the name of veterinarian, and it were better he had never entered the ranks of the profession. The every-day sacrifices of our calling, I am thrice proud to say, are borne by the rank and file of our pro-

fession throughout the land in a manner worthy of the cause. I have found in the profession a long list of colleagues and friends whose devotion to their work and whose sincere friendship are of much worth, and whose earnest lives, well lived, have added untold pleasure to my own, and which I would not have missed in this busy, work-a-day world. I am not unmindful of the heavy burdens of the hour or of the toil and sacrifices that you have endured the past year. I am not oblivious of the trying ordeal you are passing through, but the darkest night has its dawn, and the sunshine of prosperity will pierce this period of adversity, and, like the opening petals of the morning flowers, will come to you sweetened by the trials that have been yours to bear; and it will cheer you with a fulness of joy beyond our present conceptions. Already we note the changed sky; already we see the promised land, where higher and better will rise the column of American veterinary science to enlighten not alone ourselves, but the profession beyond the seas.

I have only pity for those who, in this period of trial, have taken false steps and so far forgotten their duty and the higher purposes of our calling as to bend their energies and strain their consciences by entering upon questionable methods of practice, resorting to the usages of charlatans and knaves in the preparation of nostrums and remedies of little value, thus imposing upon an ignorant and gullible public and bringing unjust censure upon our profession. The man who resorts to these measures should be branded a fraud and a knave. I am filled with regret for those who have so far forgotten themselves as to take this false step, for it leads only to danger and disaster, and to continue, means to them and to us all the loss of every honest aim of the profession, and in the end must bring disappointments and loss of character.

These hours of deep concern on our part have brought forth better things than we had planned or hoped for. It has shown the way to broader fields of labor and opened full wide a domain of usefulness in sanitary work unlimited in scope, where all mankind may reap the greatest benefits, and which will command for us the highest meed of praise and admiration.

Our schools to-day are on the highest basis they have ever attained, and the future promises that they will become bulwarks of strength and power, and their teaching will shed lustre upon our efforts for higher education, which must fill you with joy as you look upon the results as a part of the work to which you have contributed so much. In this direction permit me to quote from a recent annual report

of one of our universities in reference to its veterinary department: "The conception of the aims and possibilities of a veterinary school is, I fear, very limited in our community. The aim of this school is not alone that of training men to minister to the ailments of the lower animals. While this is an essential and worthy object, the school has a higher purpose—that of demonstrating the relations in which such diseases stand to the welfare of the human family. Certain it is that this object is worthy the support and assistance of the State, the university, and those private persons whose munificence and philanthropy are directed to the alleviation of suffering and the improvement of education." And I would add that the day is not far hence when this must be the aim and purpose of every veterinary school in our land.

Our positions of honor and trust, national, State, and local, are all tending toward the merit-system of election, and thus there will be given to them higher character and more certain tenure which will bring to these places our best men, and thus add to the general advancement.

Our associations are stronger than ever, and the work they are doing as the missionaries of our cause has already been such as to win the approval and support of whole communities and Commonwealths, and thus add to the worth and need of our part of the world's work.

Our commissions and State boards of veterinary sanitary police have already done such good service as to attract the attention of the people of our own country as well as that of the Old World—a tribute of no little worth to add to our pleasures and joy. Tried and true men have in most instances found places on these commissions and boards, and the campaign of education has gone on in a manner that surely has brought joy to one and all and which promises much for our future growth and development.

What shall I say in commendation of the grand work done in the Bay State? Planned on such a scale, and with ends so well outlined in advance of the times, their scope and boldly defined purposes startled us at the seeming rashness of the undertaking, and, owing to the radical measures advised, made us seriously doubt a successful issue.

But now we are filled with joy and pride at the results obtained; the information gained; the good done; the health and happiness of a people conserved; the moneyed interest of a class of our people protected—a class that has long borne the burdens of the day, and

whose load has yearly grown heavier to carry. We may rejoice amongst ourselves that those who planned and directed this work so well, and who sacrificed so much to its successful prosecution, are our fellow-members and colleagues, and they well merit that which we are proud to render them—our sincere appreciation, admiration, and approval of the work so well done.

Our Bureau of Animal Industry and its correlative bodies, the State Experiment Stations, have been steadily adding to our wealth of knowledge and advancement, cutting away the brushwood that obscured and covered up the truths hidden deep in nature's methods. They have investigated the perpetuation of species and kinds, and through their researches the ravages and destructive forces of microbic bodies have been checked, and our people have, in a manner, been saved much of loss and hardship that brought disappointment and trial as the fruits of their toil. Better still will be the work of the national department in the future, for the establishment there of the merit-system of appointment has already increased the efficiency of the service, and it will become the aim and ambition of many of our best men, who may have ambition in this line of work, when they see that merit prevails and that tenure of office depends solely on good behavior and ability to perform well the services required. One now feels like commending this service to the consideration of all, for it affords great opportunity for development in our profession, some of whose abilities and powers might otherwise never be fully brought forth. It will enhance this work in every way, and its richest fruits are yet to be gathered, though the service already rendered by this department stands out more prominently as a true wealth conserver and safeguard to our people than that of any other department of our government. When measured by the relative cost to the immense moneyed interests represented by our live-stock industry, it is beyond question a most useful department of our government. I cannot refrain from adding a word of praise at this time for the Chief of the Bureau of Animal Industry, whose long years of sincere service to the work of this department, through every form of tribulation and trial and under the most pernicious methods of filling office, cannot be too highly appreciated; and I can best express my approval of his work in this direction by saying that I know no one of our profession in this country who could have done so well.

Another thought I would have you keep in your mind in these days of vaccines, antitoxins, specifics, and agents which are sup-

posed to dispose of every disease by a single measure or a fixed plan of treatment, and that is that the field of scientific medication and the proper use of drugs are yet for many years to fill our chief reliance for success and to measure our worth in every community. Calomel, aconite, belladonna, and cinchona bark; aloes, epsom salts, and linseed oil; saltpetre, digitalis, and sweet spirit of nitre have not lost their potency for good, and each has its use and action, more valuable to-day than ever before, for surely he who has lived in the profession the past ten years must have learned how better to use these and every other drug. How and when to use these efficient agents and the more potent and well-prepared thousand-and-one others crowding upon us to-day demand our earnest attention and closer study, that we may reap a full harvest of good results in their use and add something of value to the storehouse of veterinary therapeutics that has for so many hundreds of years served well the aims and purposes of our predecessors in the days when serums and antitoxins were unknown.

Briefly have I alluded to a few aspects of our profession as they present themselves to-day, only to remind you that the scope of our work is still enlarging, and will command from you greater devotion and deeper attention for the future. These vitascopic views of our work must surely impress you of one great need, to which I beg your indulgence for a few moments, and I would that I might say something to impress upon you its deep and vital importance to our future well-being. Higher veterinary education is the demand of the hour, and I have only words of praise to those schools, so true to our interests, that have added so much strength to this work during the past year. The opening college year for 1896 brings the richest promises on all sides; and it is this great stride, this promised fruition of our hopes and wishes, that I desire to refer to for a moment. It is our duty as followers of the profession to commend publicly those who in these inauspicious times have courageously taken this step of advancement. They should command from us, individually and collectively, the most earnest support we can give them, and at all times our voice and pen should be ready and willing to aid them in this laudable work. In your community you should each take an active interest in any man who may be considering the veterinary profession as his future calling, and see that, so far as you may be able, he shall be so advised and influenced as to select one of the now many good schools, where he may obtain such an education as will equip him well for the work to be done.

In every way that you can contribute to the thoroughness of the work in these schools you should do so directly and indirectly, and make use of every opportunity to enable those who are to be your and my successors to be men of well-filled minds and of a breadth of knowledge that shall make them better able to fill the *rôle* of veterinarian than you and I have ever been. When you have done this you have only discharged your duty as members of this Association, and have fulfilled the pledge of membership that added you to our number.

Another field of usefulness commands your support and aid, and it merits this to-day more strongly than ever before. It comes to you more worthy of your recognition, and should be made better and stronger and kept thoroughly apace with every other avenue of our calling. No occupation, no trade, no field of labor, no work but must have its channels of communication through which every subject of importance may find a medium of discussion—a way by which every votary of our calling may be enlightened by our progress and kept steadily informed of all advances along the line. I refer to your journals, and I freely admit they are not what they should be; that they do not fill completely the *rôle* of power they should. Still, it is wholly within your own hands to give them that which they need. The veterinary journals are for the expression of your views, for the recording of your cases, for the relation of your experiences, for every aspect and work of your adopted vocation, to make strong and sure your place among the enlightened nations of the earth as a progressive branch of our world-wide profession, and to contribute your share toward that enduring wealth of every nation or calling, its literature.

With this hurried review of some phases of our work I bid you all the most thorough consideration of the broadest programme ever presented for your instruction and entertainment, which, I am sure, will add to the wealth of knowledge of everyone present; and when we shall return to our field of every-day work it will give us a strength and a confidence that only those can appreciate who have annually attended these gatherings from which so much help is gained.

There could be no more laudable wish for any member of our profession than to be called to the chief place in this organization, and thus to represent his profession in such a nation as ours. For seven consecutive years I have been honored by this Association in official place—four years as your Secretary and three years as your

President—and I cannot lay down the duties of office without an expression of my sincere appreciation of the honors you have conferred upon me. Equally have I felt that no greater responsibility could fall upon one's shoulders. Not unmindful of how far short I have fallen in advancing your work through this organization, I shall carry to the end of my life the pleasant memory of this recognition of your esteem and the most lasting recollections of the warm support and assistance I have always received from the members of this Association.

THE RELATION OF HORSESHOERS TO VETERINARIANS AND VETERINARY COLLEGES.

By H. D. GILL, V.S.

That the "relation" which forms my subject is unsatisfactory is surely appreciated by every veterinarian. I shall try to state in this paper what the present relation is and in what ways it is capable of improvement.

First, what is the horseshoer at the present time? He is, I should answer, one trained to manual dexterity in making and applying horses' shoes; he does not usually have, and I am going to ask you to note that he does not need, literary education even of the most elementary description; he has and needs only a very ordinary ability to contrive and to imitate.

I may as well say here that in this paper I am speaking of the *average* horseshoer as he is met in cities. For the modesty, judgment, and observation of many country workmen, as well as for the skill of a few city shoers, I can only express my compliments.

I can mention a number of names of persons, some of them well known to a few present, who can neither read nor write, but are skilled artisans, and to whom I should not hesitate to send the most valuable trotter to be shod, and from whom I should expect good results. Then, again, I know of excellent floormen who can, by proper use of the knife and rasp, preserve and level a foot perfectly, but cannot turn a shoe; there are others who can work iron admirably and fit shoes perfectly, but cannot properly prepare the foot.

Horseshoeing is, however, of very varying degrees of difficulty, and requires for its performance correspondingly varying degrees of skill, knowledge, and judgment.

The most important part of normal horseshoeing is the preparation of the hoof for the shoe, so that normal equilibrium may be maintained and a healthy condition preserved. In this perfection of action is aimed at and the most usual causes of lameness guarded against.

Can the horseshoer whom I have described do this work? There is little doubt that for the most part this is done not badly, and yet all have seen cases of normal feet transformed into pathological by the continued shoeing of incompetent men. On the boundary between physiological and pathological horseshoeing is the correction or diminution of faulty action. This includes measures taken to alter the distribution of weight, to lessen concussions, and to develop, improve, or alter the gait..

With all his skill in working iron, and his trained eye and ear, both so necessary to determine the conditions on the surface and beneath, the position of the shoe and of the nails which fasten it, is our horseshoer competent for this somewhat advanced work? I say emphatically, no. He should have in addition a knowledge of the external form and action of the horse, his natural balance, and the means of preservation of the same; this must include some knowledge of the general laws of mechanics, but especially of their application to the living animal, both standing and in motion. For this almost purely mechanical function of providing a support for normal feet, a knowledge of the anatomy and physiology of the horse's foot is not an absolutely necessary qualification; but, on the other hand, to furnish a basis for correct judgment and wise treatment of a diseased condition there must be, in addition to practical skill, a general knowledge of veterinary medicine, especially that part of it relating to the apparatus of movement.

Truly pathological horseshoeing covers the treatment of diseased conditions of the foot by the application of shoes modified for that purpose. To prepare a diseased foot and properly to modify the shoe is a proceeding of no ordinary responsibility, and in undertaking such a task a horseshoer should place the responsibility where it belongs—on the veterinarian, and follow his directions exactly. The shoer then bears the same relation to the veterinary surgeon that the nurse does to the physician. For there is no question that the present horseshoer is, almost to a man, incompetent. Incompetence, however, deters no horseshoer from taking a case and botching it much or little, as luck determines.

The veterinarian, in the line of professional duty, comes in daily contact with the horseshoer, who very often professes, more generally to the owner, to know more about the case than does the doctor (in some cases this is quite true); this tends to rupture their friendly and professional relations, and the result is the probable loss of a customer to the smith. Ignorance and presumption on the part of

the shoer is then the substance of my charge. Is there any fault attaching to the veterinarian? It must be admitted that there is.

Veterinarians are too often deficient in the knowledge of this subject, and it is a conservative estimate that not one in a hundred can readily apply that knowledge he has of horseshoeing so as to invariably get the desired result. He cannot expect to shoe or intelligently direct the shoeing of diseased feet without first having shod healthy ones, nor can he appreciate a diseased condition properly unless familiar with the foot in health. What can be done to remedy these evils? As ignorance is the chief cause, education must be the chief remedy. First I will speak of education of the shoer.

The majority of horseshoers, especially those in our large cities, possess little if any primary education (in but few cases have they been graduated from a public school); nevertheless, led by ambition and favored by the comparatively simple conditions hitherto required, quite a number have studied veterinary medicine, and to-day are successful and respected members of our profession.

These conditions have been changed, and now I doubt if there are many horseshoers in the United States who could pass the New York State Board of Regents' preliminary veterinary examination as required by law; and I am also safe in saying that few having education enough to obtain a regent's certificate would take up the business of horseshoeing, which requires not less than ten hours daily of the hardest kind of labor, and in consequence of which one is unfitted for any night occupation but rest and sleep, when that amount of education would open to him other cleaner, easier, more dignified, and more remunerative fields. If, however, the horseshoer should educate himself to that degree, he would not remain at the forge, but would seek a less laborious vocation, and, if one infer from the past, that vocation would be the practice of veterinary medicine. The study of veterinary medicine as a whole may therefore be considered for the future impracticable for the practising horseshoer. His knowledge may, however, be advanced in two ways: First, by the appointment at the various veterinary schools of professors of horseshoeing, who should devote time and attention to the subject, experiment with methods and materials, and publish the results; thus not only the horseshoers, but veterinarians as well, would gain. The best known could be gotten by all at very little cost of time or money. The proper application of the knowledge so gained would prolong the usefulness and life of the horse, save the horse-owners an incalculable amount of money, and raise the

standard of the calling to a scientific plane. Secondly, by the establishment in veterinary schools of courses of practical work and demonstration, which should be given at suitable hours and should cover the necessary instruction.

Education of the veterinarian is not less needed. For this we must blame the schools, for with few exceptions no practical work is given, nor the principles of mechanics, as applied to locomotion, taught at all.

That horseshoeing is one of the most important branches of veterinary surgery none will dispute. Our colleges of to-day are giving most of their time to hygiene and preventive medicine which concern the cause and prevention of diseases of live-stock, and which aim to prevent the transmission of these diseases to the human family; in doing this scientific and valuable work the no less scientific work, which is certainly that most valuable to the average city practitioner, the study of the causes and treatment of lameness in the horse, becomes to a certain extent neglected. Practical work at the forge is an indispensable part of the curriculum of an advanced college, and for this a college equipment should include forges where general shoeing is practised and taught. The course of instruction should consist principally of practical demonstration. Horseshoeing ought to bear the same relation to veterinary medicine that dentistry does to human medicine, and with this view it would be reasonable to ask for special schools which should be started in connection with veterinary colleges. These should grant, after proof of proficiency, an appropriate degree and a diploma which should say that the holder is especially qualified to treat intelligently lameness in horses and to direct shoeing for all conditions. Thus equipped, such specialists would get better results, and with these higher prices for their work. These schools should include in their pupils both horseshoers and veterinarians.

It is indeed remarkable, when one considers the enormous value of the horse in this country, the great amount of money spent in developing and increasing speed, and the intimate relation horseshoeing bears to the same, that so very little has been done to improve the methods of shoeing and to spread the knowledge of what has been done. I speak seriously and with a full appreciation of the need when I say that it is the imperative duty of this authoritative body to devise and promulgate some plan whereby improvement in the status of horseshoeing may best be brought about.

Special investigation and instruction along the lines I have indi-

cated would make the shoeingsmith more keenly alive to the responsibilities of his position, the veterinarian a more just critic, and would thereby bring about a more satisfactory business and professional relationship between the two, and would advance the average grade of work done by both.

To sum up:

1. The present needs are better education of horseshoers and veterinarians in the art of horseshoeing.

2. This education proceeds along three lines:

a. Special investigation of the problems of shoeing; this calls for a sort of laboratory of horseshoeing.

b. Special courses of demonstration in veterinary schools.

c. Special schools in connection with veterinary schools.

DISCUSSION.

Dr. Hughes: Dr. Gill, in his paper, has placed before this Association the exact relation to-day between the horseshoer and the veterinary surgeon. At this time, when veterinary science is making such progress, I think it is only fair that we should extend a helping hand to the struggling horseshoer. So far the horseshoeing craft has been satisfied to designate its calling simply as a trade. Undoubtedly some day it will be just as much entitled to the term profession as ours. Those who are acquainted with the progress that has been made even in horseshoeing during the past few years must have observed the general clamor that to-day exists in that profession for knowledge, not only of the principles of horseshoeing, but also in regard to the structure and functions of the horse's foot. It seems to me that it is the duty of our profession to foster this knowledge-seeking on the part of the horseshoer. It is only human that we should encourage them in the study of the anatomy and physiology. Naturally the horseshoer turns to the veterinarian to help him. In several cities throughout the United State horseshoeing schools have been established during the past year, and from what knowledge I have of the progress of them their success has been assured. In Chicago I have had the pleasure of conducting a school of this kind during the past year, and from the interest shown by the horseshoers in the study of matters relating to the foot, more especially to its anatomy and physiology, I have been

encouraged in every manner to extend it. They have evidently reached the conclusion that the time has come when they need something more than the mere knowledge of the mechanical turning of the shoe.

I recur to the question as to how this teaching should be conducted. The school should be established in connection with veterinary colleges. He should be taught the elementary anatomy of the locomotory apparatus of the horse, a general outline of the skeleton, the structure of the joints, the muscular system, so as to give him an idea as to how the feet are supplied with nourishment, and then the nervous system. I do not think the pathological conditions of the foot or pathological shoeing should be taught. A pathological condition belongs to the province of the veterinarian.

Dr. Robertson presented his views in a written paper, as follows:

MR. PRESIDENT AND GENTLEMEN: It is with great pleasure that I appear before you at this time, by the kind invitation of our worthy President, to present for your consideration the educational features of the Master Horseshoers' National Protective Association, together with the subject of veterinary instruction in schools of farriery.

Horseshoeing has always been a subject of vital interest to the veterinarian, inasmuch as it is inseparably connected with the pathological conditions of the locomotory apparatus of the horse; and the responsibility for these conditions has always been an interesting subject for the student in equine orthopædics. Many of the brightest minds of the profession have given the subject a lifelong study and considered it not beneath their professional dignity to become proficient in the practical use of the tools in the application of their ideas. Particularly was this so among the early veterinarians, especially the French, and we must not forget that grand pioneer in farriery, Mr. George Fleming, who has left us a legacy that is invaluable, as it forms a historical basis to which may be added all the literature of the craft coming after it.

It seems strange that notwithstanding the evolution of the horse and his speed, and the rapid advancement in veterinary science, this subject has not kept pace in these later years with other branches of our education. Particularly is this so in our literature. The additions that have been made have been largely by European veterinarians. The laymen have surpassed our contributions both in quality

and quantity in this country. Such men as Samuel T. Harris and Robert Bonner, with Roberge and Russell, the horseshoers have done far more for the advancement of our literature on farriery than the whole veterinary profession. Why is this so? Does this subject receive the attention that it merits as a part of veterinary instruction in our colleges, or is it because the veterinarian can make no practical demonstration of his theories that we have nothing from his pen?

The horseshoer has been the greatest sufferer from this dearth of literature, for a wide knowledge of the subject is to him indispensable if he would be a master of his art, and the lack of his knowledge has enabled his critics, with some degree of truth, to rail at his ignorance.

Healthy criticism is a stimulus to high endeavor, and it has been a powerful lever in this movement; but when criticism descends to the level of continued abuse, with no argument to support its allegations, forbearance ceases to be a virtue; and if the shoer at times seems wilful and opinionative, we should remember that most of his criticism has been of the latter kind. The injustice of such charges must be apparent to every fair-minded man when he considers the fact that the shoer has had no opportunity of learning the technicalities of his trade, as there has been no school of farriery in this country; and a wise man has said "where there is no law there is no condemnation." All his deductions have been made from observation and experience. The migratory habits of many of them, and their meetings in conventions for the past twenty-five years, permit of an interchange of ideas that is valuable, and to a great extent has had to take the place of literature on the subject. As to his ignorance, I think it will be conceded that the horseshoer usually represents the average intelligence of his neighborhood, has ability to govern himself in convention, legislate for his interests and protection, and, when public sentiment calls for it, he is in the front ranks in the struggle for higher education.

Some of our weak-kneed brethren are afraid that anatomical instruction to shoers will be a stimulus to veterinary empiricism among the craft. The reverse should, and we think will, be the result, for education is the strongest enemy of empiricism.

Others, like the silversmiths of old, when the abolition of idolatry meant the loss of their business, are crying "Great is Diana!" Nevertheless, I can present this subject with confidence to this Association, for I know that the acquisition of a few dollars from

the mistakes of ignorance would never be allowed to stand as a stumbling-block to any endeavor that has for its object the uplifting and perfecting of the farrier in his art. And that this instruction may be uniform, thorough, and permanent, and the boundaries well defined by your co-operation, is the purpose of this report. The profession and the laymen have cried aloud for this instruction for humane interests, for interests of pleasure and profit; and the horseshoer himself has demonstrated his ability to receive and digest such instruction, and it remains with us to formulate a plan that will prove practical and enduring.

The call for a higher education among horseshoers is simply a part of the general demand for higher intelligence characteristic of this progressive age, and it is a tribute to their intelligence that they realized the drift of the times and were willing to avail themselves of the opportunity offered them.

The Master Horseshoers' National Protective Association was organized July 28, 1892, in the city of Cleveland, Ohio, seven cities being there represented—Pittsburg, St. Louis, Detroit, Cleveland, Chicago, Cincinnati, and Rochester. To-day it has sixty-six locals and about two thousand members. In 1893, at the second convention, held in Chicago, the master shoers realized that there was some show of truth in the allegations as to their ignorance of the structure and functions of the machine they were supposed to keep in repair. To realize was to act. They looked about them, but there were no schools opened to them where such instruction could be obtained. A committee of three was appointed to formulate ways and means to procure suitable instruction and look after the educational features of the Association.

This committee has labored harmoniously and enthusiastically, the ready affiliation of the members in their suggestions and plans giving great encouragement to their work.

A paper, the *Horseshoers' Journal*, was adopted, and members were encouraged to put their ideas and experiences in print, and a valuable acquisition to our practical literature has been secured in this way. Rules governing apprenticeship have been adopted; a four-years' course required, with an attendance at a school of farriery when possible. At the Detroit Convention, in 1895, an educational souvenir was issued, representing much of the best talent of the craft. It contains able articles on every subject connected with the trade, all written by men whose success and fame in their calling should make anything from their pen interesting and instructive.

In establishing schools or courses of lectures this committee appealed to the veterinary profession, and, to her praise be it said, she emphasized the sincerity of her professions on this subject by the giving of her best talent to the cause. During the winter months of 1894 and 1895 Philadelphia gave a regular course; Rochester, Detroit, and Cleveland had some lectures on the subject; and at the Detroit Convention, in October, 1895, the course was made more complete, but still subject to local conditions. The convention decided on a one-year's course, but the committee considered it best to make it two, the length of the course to be governed by the division of the lectures by the teachers. Philadelphia graduated her first class of twenty-two this spring, six failing to pass the required examination. Detroit has also graduated a class this spring. The desire for a course of some kind has been general, and local veterinarians have supplied the demand as best they could. During the past winter, as far as I have heard from, the following cities have been engaged in the work: Philadelphia, Rochester, Cleveland, Saginaw, Portland, Albany, Detroit, New York, Buffalo, and Chicago. The course as outlined, and as far as we know carried out, was on form, the anatomy and physiology of the locomotory apparatus of the horse, with pathological conditions that could be remedied by shoeing, dissections, when possible, the lectures illustrated by fresh specimens. The reading and discussion of papers on practical and scientific shoeing were a feature of the course. These papers were afterward published in the *Journal*. At the close of the term prizes were given.

The National Association issues a diploma to all graduates. The students were handicapped by the want of suitable text-books, but this difficulty will soon be overcome, as two are in course of preparation and will be ready at an early date. The fees have been governed entirely by local conditions, the main object in view being to make the course inexpensive, in order to encourage as many as possible to join the schools.

The apprentices were admitted free. Their wages are small, and while, as has been said, "there is a ladder leading from the gutter to the university," for them the bottom rounds are very far apart.

If this movement is to be successful it must be within easy reach of the masses; its honors must not be won by money, but through merit.

This, gentlemen, is my report of the condition of schools of farriery and the educational features of the Master Horseshoers'

National Protective Association up to this time. We realize, as pioneers in a new field, the many difficulties that beset our path; the ground is stumpy, and we are awkward at the plow, but we are rewarded by the assurance that some of the seed has fallen on good ground.

I am glad of this opportunity to offer the thanks of the shoeing fraternity to the veterinary profession for its assistance in this effort and to the individuals who have sacrificed their time and talents in our behalf. To the shoer this is not a question of silver or of gold, but of his good name.

Dr. McAnulty: Mr. Chairman, I have the honor of being the chairman of the Philadelphia school at which there have been twenty-two craftsmen horseshoers graduated. Our course in Philadelphia has been very thorough. We tried at the beginning to get the University of Pennsylvania to take up the course, but failing in that they gave us the use of their department there, and we secured the services of Dr. Harger and Dr. Adams to give the course. Our men were instructed on the skeleton of the horse, also the muscular system, blood- and nerve-supply, taking the leg from the hip and elbow down. Our men were at first a little bit slow to take hold of the matter, but when they got into the dissecting-room they advanced very fast. Our course lasted from February until May, three evenings in the week. It is the desire of the National Horseshoers' Association to have all colleges take up this course and help the horseshoers out of the rut they have been plodding in for centuries. It is not the desire of the Association to make veterinarians of these students. It is to teach them how to treat disease of the foot by shoeing and the making of pathological shoes, and to keep good feet on horses when they receive them in that condition. It is the purpose of the National Association to ask the co-operation of all veterinary colleges in this matter, so that we will place this abused art in a better position than it has ever been.

Dr. McKenzie presented a paper, as follows:

Mr. President and Members of the United States Veterinary Medical Association: I appear before you to-day in behalf of a craft, the great majority of the members of which are groping their way in darkness, so far, at least, as a scientific knowledge of their trade is concerned. So deplorable has been the condition of the horseshoer in this respect that representatives from seven cities met at Cleveland, in July, 1892, to consider whereby he might be lifted

up from the abyss into which he had been consigned by ignorance and unreasonable competition. From this meeting dates the organization of the Horseshoers' National Protective Association by a few earnest men who were willing to make some sacrifice for the elevation and dignity of their profession.

It is gratifying to know that since the foundation of the National Association there has been a very decided improvement in the science of farriery, hastened largely by the practical work of the Educational Committee from July, 1894. Schools have been established in the larger cities, where the horseshoer has been taught the anatomy and physiology of the horse's foot and leg, and thus qualified to work with his brains as well as with his hands. Rapid progress has been made, thanks to the position taken by the horseshoers as a class and to the unselfish efforts of their teachers; yet we confess ourselves unable to continue the good work properly without the assistance and co-operation of the veterinary profession, with which we are so closely allied. I believe the business ties that bind the two professions can be made still firmer without detriment to the veterinarian, and most certainly with advantage to the intelligent farrier who may be ambitious to lift himself above the rank and file of the craft.

Now, gentlemen, having stated our necessity, it is proper that I should suggest a suitable means of attaining the objects of our hopes. The establishment of a short course of lectures on farriery in all veterinary colleges is a practical solution; but this plan takes no account of the horseshoers in the smaller cities, who would be left to the cold charity of the world were not a special plan devised for their benefit. Heretofore, we of the latter class have been accustomed to call upon the local practitioner, whose splendid services in our behalf are fully appreciated and gratefully remembered; but he has not the time to devote to such a course of lectures, even admitting his fitness as a teacher. We have had lectures by our local veterinarians, each vieing with the other in the display of fluency, scientific knowledge, and oratorical ability; but the results have been of doubtful value because the aim was too high to reach those who had even studied the subject and those who were still in the rudiments. Some plan must be devised by which the young horseshoer may be enabled to practise with a better understanding of the scientific requirements of his work, especially in the State of New York, where a law has been enacted providing for an examination before a competent board. Thus it becomes the duty of the National Asso-

ciation to place within the reach of every young man who may intend to follow horseshoeing as a vocation the means of acquiring that knowledge without which, in some States, at least, he cannot be permitted to pursue his calling. I would suggest that in cities where we have no veterinary colleges the scientific branch of our art should be taught in the regular course of athenæum and mechanics' institutes, and that it should be made the duty of State Boards of Examiners to see that qualified veterinary teachers or lecturers be employed and their services properly remunerated.

One of the drawbacks to the facilities of our schools, as far as we have gone, is the lack of suitable text-books and literature for the instruction of the pupil between lectures. I am pleased, however, to learn that this deficiency will soon be in part remedied, two eminent members of the veterinary profession now having books in press. True, we have had many writers on the subject of scientific farriery, such as Robert Bonner, Professor Roberge, and R. Boylston Hall; but the value of their writings has been nullified to a great extent by the tirades of abuse poured out upon the poor, ignorant horseshoers, on the theory, I presume, that to give a man a chance to rise in the world you must first knock him down. But, gentlemen, we have been down long enough, and we want to grasp the uplifting hand of some organization older and stronger than our own.

You ask us why we come to the United States Veterinary Medical Association? I reply, because your organization antedates ours by twenty-nine years, having been formed in the city of New York, June 9, 1863. So, childlike, we appeal to you for assistance.

It is not our intention to make veterinarians of the horseshoers. By no means. But we do desire to raise the art of farriery out of the slough of ignorance; to educate its followers and widen the sphere of their usefulness among the horse-loving public; to make them something better and nobler than mere "hewers of wood and drawers of water."

But my colleagues on this committee have already covered the ground in their discussions of this subject, and we leave it to you to give the matter your kind and careful attention, assured that the results of whatever action you may take cannot but be beneficial to our craft.

The President: I can say that we have endeavored at all times to recognize the several branches of science identified with our own, and the every-day practitioner knows full well the importance of having a class of shoers intelligent and able to carry into execution

the directions necessary in pathological horseshoeing. If there was no other reason than this, aside from the all-important one that these men look to some centre to obtain education, and that it can be best given by veterinarians, it would be sufficient reason why it was important enough for this Association to take it up.

Dr. Brenton: I would like to ask if the bill recently passed by the Legislature of this State had any beneficial effect at all and in what way?

A Member: As far as the law has gone it has not yet affected us. It is not in operation, and will not be until October 18th, so the advantage as yet we do not know.

Dr. McAnulty: This bill requires that any young man wishing to practise the art of farriery shall serve the required time of three years, and he shall also have a good common school education. He will not be allowed to go from one shop to another to learn his trade. It was a move in the right direction.

Dr. Trumbower: This is not a question that affects the horseshoer alone, but the veterinarian as well. He has as much to gain by teaching the horseshoer so he will know why he must place a given shoe on a certain kind of foot. The veterinary profession has much to gain and nothing to lose; and the two are so closely associated that it is very difficult to separate them, for which reason the Horseshoers' Association should be encouraged to the fullest extent by our profession in the step which they have taken to elevate themselves, and as we are in such intimate relation we will be of equal benefit to each other.

Dr. C. P. Lyman: I have been very much struck with the earnestness of the gentlemen who presented the subject to us, and the good way in which it was done. There has been a great deal said by them that needs to be thought over carefully. I know in the course of the business of the college with which I am associated, at Boston—we employ and have employed for years horseshoers—we have always tried to get the best men we could, and have also tried to pay them as large a remuneration as possible. I was very much struck years ago by the remark of one of the shoers to me about horseshoeing matters generally, in one direction certainly, and that was that he did not know what would become by and by of the horseshoeing art; he believed it would be a lost art because of the great difficulty of making the young men take a sufficient amount of apprenticeship. I am not in a position to know as to the value

of that suggestion, but it is certainly in accord with the action taken by the gentlemen of this State in making it compulsory that hereafter there should be an apprenticeship of three years served in one shop before a young man could be allowed to leave and become a practical horseshoer. The connection between the veterinary profession and the horseshoeing art, we all know, is a close one. We all know the great satisfaction with which we meet the horseshoer who is able to grasp the suggestion that we make to him. We also know the great difficulty we meet in getting men to carry out our directions. We also feel that just in that place there is a loss to us coming. We may recommend that a shoe should be particularly placed on a horse's hoof, and we know if the instructions are carried out the results will be good. We find it hard to get a farrier who is able to carry out instructions that are given him. That is especially true in towns outside of a city where, the veterinarian is not able to stay and see that he carries out the instructions given. He not only suffers, but we ourselves suffer largely on account of the inability on his part to grasp the situation. If anything can be done to help us as veterinarians at that point, a great deal would be accomplished to save us more or less from criminations as the result of treatment which we have directed. I think if any help can be given to the horseshoers by the veterinarians we should be very gratified to give any in our power.

Dr. Cary: I would like to ask Dr. Pearson to state the instruction given in European shoeing schools—whether they limit it to normal or extend it to pathological shoeing?

Dr. Pearson: I do not know that I can answer that question satisfactorily. In regard to the instruction given in Philadelphia, it was given by their own organization and not by the veterinary department of the university. The veterinary department was requested to give the course, but they thought that it was not practicable to do so, and they offered the use of their dissecting-room to the shoers' organization, and it was therefore on the premises of the department that the course was given, and not by the department. Two of the professors were engaged in a private capacity to lecture to the horseshoers. The whole question is an extremely important and difficult one; it therefore should receive very thorough discussion before we take definite action.

Years ago European schools gave a course of different kinds of shoeing. In Vienna they gave seven kinds of shoeing—a course for seven different purposes. They conducted a first, second, and

third course—a course for huntsmen, shepherds, and farmers, and one or two others. The result of it was that they developed a large body of partly educated men who were really quacks of the worst description. They had some basis, of course, for the assumptions they made, but were totally ignorant in regard to other points of which they assumed knowledge, and the effect was disastrous in Eastern Poland, Hungary, Russia, and to a certain extent in Germany. Progress was absolutely impossible under these conditions, and eventually all courses were abolished except that leading to a high veterinary degree. We should consider the importance of this subject as well as the situation as it presents itself to-day. I am sure everybody desires a shoer to have as much knowledge as he can use to advantage, but the advantage to which they can use it is the important question. There is no doubt at all but that a great many horses are ruined—a great many thousand dollars' worth of property is destroyed every year by shoers, and much of this loss can be avoided by proper shoeing schools. I had this question brought home to me very forcibly some time ago, being called to treat a horse for suppurating corns. I removed the diseased area, scraped it, and applied a pressure dressing. I went back the next day and saw, much to my surprise, my patient standing in a tub of dirty water. I inquired why my directions had been disregarded, found that a shoer had been there who said that he was a specialist on diseases of the horse's foot, and, being a specialist, of course he knew a great deal more about it than a veterinarian could possibly know, and the owner allowed a blacksmith to remove the dressing and place the horse in this tub of water. The case did not do well, for which I was very thankful, for, on the other hand, it might have done very well, and then the shoeing smith would have received a great deal of credit. The idea of removing the dressing was, he said, that there was a great deal of pus there, and the hoof could not get well unless the dressing was removed and the pus allowed to escape. I must say I regard this thing as a very critical matter, and one in regard to which we should be extremely cautious.

Dr. Hawkins: As possibly a great many of the members of this Association are aware, there has been some little attention given to lecturing to horseshoers in the State of Michigan; I as one of the active members of that Association have been somewhat opposed to it, but I do not want any member of this Association to think for one moment that I am narrow-minded enough not to give these horseshoers a little information for fear it is going to interfere with

my general practice or my own financial welfare. My principal objections are placed on other grounds. I know in my own city of numbers of horseshoers there who have been in business ever since I have been in the city, who have been making a practice of shoeing horses with diseased feet, going still further and treating the diseases of the horse. I think we have one of our horseshoers in the city who is a graduate of the Detroit Veterinary College. He graduated about two years ago, and I understand he is a member of the National Association of Horseshoers. He has been advertising a hoof dressing, and states that he has been practising as a veterinary surgeon for the last twenty-five years, and has been using this dressing very successfully for a number of diseases.

Some of our horseshoers are making a business of advertising on their cards the treating of diseases of the horse's foot.

DISCUSSION ON TUBERCULOSIS.

Dr. Osgood: In relation to the systematic examination for the suppression of tuberculosis I would say that that was the first step we advocated to our Legislature. We did this for two reasons. One was from the geographical situation, the other that we might accomplish permanent work by going over the State once more. We thought if we began at the seaboard, keeping up a quarantine line all the time, that we were accomplishing something which would be permanent in its character; whereas if we examined animals here and there, in one county and then another, it would be impossible to put that county or section under proper quarantine restrictions. Consequently we made as strong a fight as possible to continue this class of work. We went through three counties, commencing at the seaboard, where there were but few cases, and every healthy animal was branded and a quarantine line maintained. The action of our Legislature prevented the continuance of that work.

I have seen a good many suggestions from papers in different States claiming that systematic inspection could not be pursued in their State. I grant there are many States so situated that they could not undertake it; possibly it would not be warranted. For example, in the State of Vermont we have one section divided from the other by mountains; on the eastern side a large amount of tuberculosis exists, while on the western they have not as yet discovered a case; consequently it would not be good business policy. Our systematic examination began in the section of the State where we have almost no disease and extended almost to the line where we know the disease is very prevalent. All of us recognize and acknowledge that tuberculosis exists, especially in the Eastern States, to a very great extent. The question is whether we are accomplishing all that we might accomplish by any other method than systematic examination. Of course, in removing the affected animal we remove that danger from the milk-supply.

Dr. Salmon: I am somewhat at a loss to treat this from a national point of view, because so far the National Government or

the Department of Agriculture has not had a policy, as I understand; in fact, the feeling at Washington has been that the question of tuberculosis is too large to be taken hold of by the general government at present, on account of the vast extent of our territory, the enormous number of cattle, the spread of the disease all over the country, and the comparatively small force that would be available.

I do not know but what it could be done. I believe that a sentiment could be worked up that would get an appropriation from Congress to handle the matter, if desired; but it is a very large work to undertake to treat and act upon tuberculosis for its eradication from one single central point. I think undoubtedly it is the largest veterinary work that could be taken up, and it would be injudicious at this time to agitate in favor of a national control of tuberculosis until the veterinary service is developed, and until it is possible to cover the country properly.

Now, you do not appreciate that quite as much as I do. For the last four or five years we have been trying to inspect meat all over this country—not all of the meat killed for local consumption, but all that is killed to ship to foreign markets—and we find that it is a very large contract. We had an amendment made to our meat-inspection law which we thought would facilitate the work, which required that no beef should be exported unless accompanied by a certificate of inspection from the inspectors; but we find that there is a large number of places where beef is packed in small quantities where it is impossible to inspect it; we are inspecting by far the largest portion; but there is a great deal packed at smaller houses which we have found it impossible up to the present time to handle. So that until the meat-inspection work is thoroughly covered—until we have a force in the field trained for official veterinary work large enough to handle that subject respectably—I am not in favor of trying to take hold of another work which is so much greater, for we must appreciate the fact that tuberculosis inspection and eradication would be a much greater work than the system at present of discovering and eradicating pleuro-pneumonia. We must count on building up the veterinary service gradually, and just as soon as the field is covered in the meat line I am in favor of taking up some other question; but at present it is premature; the work is too large; and I am not in favor of agitating Federal interference, and am in favor of leaving it to the State authorities and to the city and municipal governments. I think they can handle the matter where it is most urgent—that is, they can take hold of the milk-

supply of the city for the eradication of the disease in the large dairy herds from which the supply comes, and that is where the greater percentage of tuberculosis exists, and the local authorities have the means of bringing the pressure to bear which the Federal government has not. There is some advantage about doing these things through the Federal government, and one of the principal things is the financial aid, which is an essential, and it is one of the points which we cannot afford to overlook; but no matter how much money you have, unless you have the authority back of it; unless you are able under the law to go upon a man's premises and inspect his cattle whether he is willing or not, it is not much use to have the money. The Federal authorities cannot operate except with the co-operation of the State. I am glad to see that the feeling between the Department of Agriculture and the Bureau of Animal Industry and the State departments has been growing better ever since we have been doing the work. At first there was a great deal of jealousy, and it was troublesome work to get co-operation, and when we got it we never knew how long it would last, because every now and then there would be a rupture between the Federal and State authorities, and we would patch it up. The work of pleuro-pneumonia has been gradually improving, and at last there is more accomplished and more confidence, and I am happy to say that it looks now as though in a few years it would be possible to establish a perfect co-operation, where each would do its share and contribute to the final success.

Dr. Pearson asks me to say something in regard to the after-effect of tuberculin in unhealthy cattle.

The only after-effect of tuberculin is a shrinkage of the milk, which, I guess all of those who have made the test admit, occurs in a great many cases. This probably occurs partly from exciting the cows during the test and probably also partly from the effect of the tuberculin. It has in some herds, if the reports of the owners can be believed, lasted for some weeks. Some have claimed that it lasted during the whole milking period until the cow was fresh again, but I have doubts about that. I think probably the milk shrinks a week or two, depending on the after-care of the herd. As to the bad effects of the tuberculin, I do not know of any place where the disease has been started up and the feverish condition made permanent by tuberculin. On the contrary, it appears to me, where I have seen the substance used, that the tendency was to make the disease more chronic, to make it less acute; that there was more or less

curative effect from tuberculin; and that, so far from its producing these effects, the milkmen claim that it has an opposite effect, and from the inquiries that I have made it appears to me that these statements, these charges against tuberculin, were the least reasonable of any that have been made, for it is certainly pretty well established that the effect of tuberculin is the opposite from increasing the acuteness of the disease. In the human subject we know the disease does in some cases seem to be made acute, and, while it is possible that it occurs in individual cases, it is very rare.

It is also claimed that tuberculin renders the animal more subject to tuberculosis; but that also, in my opinion, is an unfounded claim, and I believe that the effect of tuberculin is beneficial rather than injurious.

Dr. C. P. Lyman: In regard to the probable influence of tuberculin upon the supply of milk, Dr. Salmon has just told us that he has very great reason for believing that there is cause of a certain shrinkage after receiving the treatment or the test of tuberculin. I should like to ask if he has any reason for thinking that the treatment of animals while undergoing the test has anything to do with that, the actual use of the tuberculin? We know that cows giving a large quantity of milk by the treatment which they generally receive at the dairies are pretty delicate machines. We also know that it is the habit of users of tuberculin to restrict the food and water while undergoing the test. Is it not rather likely that of the two this sort of treatment is responsible for the lessening of the milk rather than the effect of the tuberculin? We know also that if anything occurs in the way of interruption of the food and habits of animals being used for the supply of milk it is oftentimes extremely difficult to get those animals back to the flow of milk before that interruption. In the experience of observers, if we believe the reports that are made to us, while we have received a number of complaints that the administration of tuberculin has lessened the supply of milk, we have received a number of definite instances in which the quantity of milk was absolutely increased. That is not guesswork in these reports. They have come—because we have got a number of them—they have come from herds wherein the greatest care was taken about the food and the amount of milk given—that is, the milk in its natural form was weighed and a careful record kept, and I say in those instances there was a number of reports given where the milk was absolutely increased after the administration of the tuberculin. May it not be, then, due rather to the

interruption of the food and care and quantity of food than the tuberculin?

Dr. Salmon: I am glad to hear the remarks of Dr. Lyman. I suppose there is no one in the room who has had more experience and has come in closer contact than have the gentlemen who were upon the Massachusetts Commission in these matters. While I get the reports of the test, I do not get reports in a very large number of cases of the effects of the tests upon the milk-supply. The statements which I have made were based upon reports which I have received in a number of cases, and I had come to the conclusion, as I stated, that the shrinkage was partly due to the handling of the cows by people who were strangers, and feeding and watering at the time of the tests being lessened. I have also partly attributed it to the effects of the tuberculin, but I think the experience of the Massachusetts Commission is much more important than mine in that respect, because I have not come so directly in contact with the herds and with the owners.

The President: "The Danish system of controlling tuberculosis" is one of the topics on the programme, and we would like to hear from Dr. Pearson on that subject, as he is familiar with the foreign systems.

Dr. Pearson: Before saying anything in regard to the Danish system now in use in Denmark I should like to have a word in reference to the effect of tuberculin on healthy cattle as regards the milk-supply.

The herd belonging to the Agricultural Station of Pennsylvania has been tested with tuberculin. It is the practice there to keep a record of the milk and also the quantity of food, and a chemical analysis is made of the milk every morning and night; and it has been found there that the tuberculin-test results in the diminution of about 3 per cent. for the day following the test, but the next day the normal flow is re-established. This variation of about 3 per cent. is less than the normal variation on any other day when the test is not made, from some disturbance about the barn from putting in hay or threshing.

As regards the Danish system of using tuberculin, I am sure all of you have read the work of Professor Bang, and you understand the principles described there; but as the question has been delegated to me, perhaps I had best describe the principle very briefly.

The practice of Denmark is to test herds generally with tuberculin, and then, after discovery of tuberculosis, instead of destroying

the cattle at once, those found to be tuberculous are preserved, but kept in separate stables or farms, entirely away from healthy cattle, and the premises disinfected and preserved from infection in every way. Sometimes it is not possible to place them in a separate stable, and they are kept in a separate department of the same stable, separated by a tight board partition and by entering at separate doors. From time to time these divisions of the herd are retested, and those showing physical evidence of the disease are taken out and destroyed. The milk from the reacting animals is used. Dairying is the principal industry in Denmark, and the milk is produced for butter for export into England and other countries. They find that by heating the milk from these reacting animals from 165° to 170° it makes just as good butter as milk that is not so treated, and it brings just as high a price in the market; and, in fact, sometimes the milk from the healthy cows is treated in the same way, and the quality of butter produced in that way is very good and commands the highest price in England. The milk seems to be harmless treated in that way. They are cared for by separate attendants.

The restrictions regarding the progeny are very stringent. The calves from these reacting cows are removed at once from the premises in which they are born; they are given milk from healthy cows or sterilized milk, and in that way they cannot contract it unless they are born with it, and in that way they develop into useful animals.

That plan, however, is a rather expensive one, but not as expensive there as to destroy all of the animals that react, as they would not only lose a large sum of money at once, but they would lose a large proportion of their dairy stock; they would lose a large proportion of the source of their national wealth, and it is thought that the country could not stand it.

From time to time the reacting cattle are retested, and it is found in three-fourths of the cases, I believe, that these cattle that reacted once react the second time; some react three times and not the fourth, and in this condition they are retained in these dairies and continue to give milk and produce calves until they develop tuberculosis in a more advanced form or until they die of some other disease. In that way Denmark is getting rid of tuberculosis at a comparatively small cost, and in Denmark the method is a good one.

The French system is very different. Denmark is a smaller country, but her source of wealth comes from her dairies. France is a much larger country and the number of cattle is very much greater.

In France the system that is adopted is this (it is a new system that has gone into effect since the last law was passed last year):

No cattle can be brought into France unless they are previously examined for tuberculosis by tuberculin. Whenever they find an animal that presents physical evidence of tuberculosis that animal is slaughtered, and the herd in which that animal is found is tested with tuberculin. All slaughter-houses in France are under government or municipal control, and all of the meat killed for consumption is examined at the time of the slaughter, and a careful record is kept of all, of the origin of the cattle destroyed; and whenever an animal that is tuberculous is found in the slaughter-house—after an animal is tested for tuberculosis—the owner has the option of what he will do with the animals that reacted. He is allowed to destroy them at once in one of the slaughter-houses, and if the disease is very slight the flesh is used, and if the disease is extensive the flesh is destroyed. He is not allowed to sell these animals or keep them where other animals are, and he must keep them away—he must avoid both direct and indirect contact with other animals. After six months the option expires, and the animals must then be destroyed. This is so the animals will bring a higher price in the market and can be used. They are then killed under government inspection, but if it is necessary to destroy the carcass the owner loses all—that is, by electing to keep the animal six months he forfeits the right to compensation that he is otherwise granted if it is destroyed in the slaughter-house.. If the animal is killed at once, and it is found to be unfit for food, the owner receives one-half of the whole value of the carcass.

In Germany there is as yet no general system in reference to this test. Veterinarians use a great deal of tuberculin when they examine cattle, and it is supplied at a very low cost, and the use of tuberculin is favored in every possible way, but as yet the government has formulated no definite measures that are to be followed in dealing with tuberculosis.

Now, I think that it is well to call your attention to these foreign systems because they may teach us a great deal in our dealings with tuberculosis.

The question as to what shall be done in this country is probably the greatest question that the veterinarians have before them at this time. In small States, and especially where there is a great deal of tuberculosis, in such States as Massachusetts and the other New England States, it seems probable that there is but one profitable

course for the public to follow, and that is to make a systematic inspection and separate the inspected territory and allow no animals to cross that line until they are inspected, until the entire State has been covered, and until all other animals that have tuberculosis have been destroyed or handled and treated in such a way that there is no way for them to continue to spread the disease.

But in larger States—in this State and Pennsylvania—I do not think that that scheme is feasible, as Pennsylvania is a State 350 miles long and 150 miles wide. In Pennsylvania there are over a million cows—that is, over a million cattle—not all cows. I think about a million and two hundred thousand. Now, you can readily see that if we were to attempt to make a scientific examination of all of these cattle the expense would be enormous. The time that would be required would be very great, and as Dr. Salmon brought out at a meeting of the State Board of Agriculture two years ago, that at the time the end of the State was reached another generation of cows would appear in the eastern end, and unless there were extreme measures adopted it would be necessary to begin all over again. If it costs fifty cents a cow to conduct the tuberculin examination—and it would undoubtedly cost more than that—the total for investigation and supervision would be considerably above a half million of dollars; and if 10 per cent. of these animals were infected—although I do not believe that 10 per cent. of the cattle of Pennsylvania are infected—the cost of compensation would be several millions of dollars, and it is utterly impossible at the present time to get large sums of this kind from the State Legislature for this purpose, so that a systematic examination of all of the cattle in Pennsylvania cannot be considered; but still, that is the proper system where it can be done, and it should be done.

Now the question is, What shall we do? Shall we adopt the Danish method? Shall we examine the herds supplying the cities with milk, and allow the animals that react to remain alive, and to provide that the milk shall be sterilized, and not sold until this is done, and to insist that the offspring of these animals shall be fed on the sterilized milk of reacting cows or from healthy cattle? This plan has been thought of in Pennsylvania, and it has been submitted to a number of herd-owners where they have applied for an inspection of their herds, and they have been given the option of having their animals killed outright, or the Danish method, and in every case they have taken the former plan.

While a great many cattle can be saved by the Danish method,

these herd-owners have thought that it would not be a profitable thing to keep their cattle under these conditions, and it would not be profitable for the State to keep them under any other condition. They have maintained that if it were known generally that they had quarantined animals on their farms the reputation of their products would be destroyed, and therefore they have immediately chosen the other plan.

Now, we have commenced inspecting cattle in Pennsylvania in this way: Since it was impossible to inspect all of the cattle in the State systematically, and since it would be unfair to the taxpayers at large to select a certain small portion of the State and examine all in that portion, and examine all of the cattle supplying one city and leave all others, we have arranged to examine all herds of owners who apply for examination and who agree to observe certain restrictions in reference to the reproduction and redevelopment in their herds of any cattle infected with the disease. The application is made on a printed form, and in making the application the owner promises to observe every direction recommended that tends to the purification. If he has to tear down half his barn, or cut windows through his stables, or put in new floors, he agrees to do that before the examination is made, and he agrees also to procure his animals for restocking from as healthy a source as possible. Now, there is the weak point. We would like to require all these herd-owners who have their herds examined at public expense to purchase only such cattle as have been examined and proven free from the disease, but we find this thing impracticable. Sometimes it would cost more for a farmer to have his animals tested for tuberculosis than they are worth, so that we cannot enforce this provision always; but I hope we can persuade them in the near future that it will be more profitable to purchase animals that have been tested and proven free from the disease.

The Bureau of Animal Industry has done a noble work as regards the inspection of cattle for pleuro-pneumonia, and as regards inter-State meat-inspection to a certain extent. But it appears to me that their control might be extended at a small cost, so that all the Eastern States would derive a very great benefit. Most of the cattle that are brought into the eastern part of Pennsylvania, especially, come from the West. They come from Illinois, Iowa, and Missouri—a large proportion of them are purchased by the dealers in Chicago and brought East over the railroad lines that centre in Buffalo and Pittsburg. Most of them are taken from the cars for

feeding at Buffalo and Pittsburg. At Pittsburg several hundred milch cows are unloaded and reshipped to points in Pennsylvania every month. The Bureau of Animal Industry has two inspectors there, and it occurs to me that by a very slight addition to the force these cattle might be detained a day or two longer and examined, then tagged in some suitable way and their condition certified by the inspector, and the purchaser of that cow would have a guarantee as regards her health. And if farmers were able to buy cattle in that way we could require them to buy them, and make the owner agree that he would purchase no animal that had tuberculosis. I think we could require that and get along very much better in our work, and the money expended would be to a very much better advantage.

Of course, it might not be necessary to extend this to all of the States, because it is undoubtedly a fact that in the Western States there is far less tuberculosis than in the Eastern.

Dr. Kilborne: Would the cattle be in condition to be tested while in transit?

Dr. Osgood: We tried to adopt that plan—that is, testing the cattle on the day of their arrival, and we found it was impracticable. We made it a rule that if people desired to bring cattle into the State of Massachusetts they must test them before leaving home or after they arrived, at their expense, after being there six days.

Dr. Pearson: We have no way of controlling that work. Now, I have heard where some cattle were purchased in Pennsylvania for a shipment to the New England States, and the dealer engaged a veterinarian who was not competent at all to make this tuberculin-test. Well, it was reported to me from a very authentic source that he used cold tea instead of tuberculin, and of course he got no reaction. I do not know whether the cattle were tested again. Since I have been in Buffalo I have learned by conversation with a veterinarian who was here yesterday that work of that character has been done in this State. It is not necessary to say where it was done in this State, but he informs me that he is sure it was done, that colored water was injected, and their temperatures were taken with a thermometer that contained no mercury.

Dr. Osgood: I think that it is the fault of the commissioners. We do not accept the certificate of any veterinarian unless he is vouched for by the State Commission. I was notified by telegraph of a matter similar to that—of some party who employed it and tried to find it out, and we had some further work from the man and

made a complete examination, and I do not believe any such work was conducted. But it is the fault of the commission from the State where they were shipped. Even though fraud does enter into it, a large percentage of the work is accurate and honest.

Dr. Pearson: My point is that it would be more accurate and more honest if they were done under the Bureau of Animal Industry. I stated that the work was done in Pennsylvania. I would say that no one has been recommended by the Live-stock Board for testing cattle that enter into inter-State trade.

I have called attention to the plan that is followed in Pennsylvania, and suggested an improvement in connection with that plan which I hope will be considered carefully.

Dr. Trumbower: In my capacity as State Veterinarian I quite commonly run across cases of tuberculosis accidentally, and as I was appointed one of the city meat-inspectors of Chicago for the purpose of having the right to condemn animals that I considered unfit for human consumption, my attention has been frequently called to this question. I have only passed as fit for consumption animals which apparently were affected to only a very slight degree, and, we might say, of recent development—such ones as only manifested evidences of disease in one or two glands that were not intimately associated with muscular structure. Where a system of glands closely connected in their functions were affected, I unhesitatingly condemned such carcasses. Where we find two or more different organs involved we condemn such a carcass. Where there is evidences of emaciation where it is due from such an infection, we condemn the carcass regardless of the extent of the lesions presented. But we must always remember that in making examinations at the slaughter-house, especially where there are many cattle killed in a short space of time, little time is given, and it is very superficial in its character. We only have time to make an examination of the most prominent organs that are usually found to be affected in advanced cases, and for this reason there may be animals escape in which lymphatics imbedded in muscular tissues or in various portions of the body are affected, in order to take which we have practically to destroy that carcass as a matter of commerce. We would have to mutilate it to such a degree that it would not be fit to put on the butcher's block for retail purposes.

The question, of course, arises in the scientific mind that when an animal is affected at all by tuberculosis it is fully as dangerous in the initial stages as in the advanced cases.

We must have more evidence to prove the virulence of milk than we have now before we can convince many of the physicians that it is of a sufficient degree of danger to warrant radical measures looking toward the inspection and condemnation of cattle that may be slightly tuberculous. It is a question that is now agitating St. Louis. They adopted an ordinance there a few months ago for dairy, milk, stable, sanitary, and hygienic inspection. The first report was that in the city dairy farms twenty-one out of twenty-eight reacted, and everyone interested in the dairy business became alarmed, and they ridiculed the idea, and actually prevented the slaughter of those twenty-one animals that reacted, and they are still there, living and in dispute. The State apparently is powerless to act in the matter. We have one town in the State of Illinois which has an ordinance for meat-inspection. It is working well so far. All that has been done in Illinois so far has been by application of owners of dairy farms, and they agree to destroy all animals infected. They give directions free, and the owner is compelled to destroy all animals, subject to post-mortem examination, that react. We cannot afford to pay for all affected animals, and there is very little hesitation about destroying those that are affected, and out of 653 animals we tested from January until the middle of May we found eighty-nine reacted to the degree that we felt warranted in condemning them. They were all slaughtered, and I made an inspection of them, and in the record that we made and published we mentioned two mistakes. There was only one, I believe. Two out of eighty-nine were published as mistakes; and I think that is very creditable. We intend to go on with this work as fast as we can, and especially educate towns and cities to pass ordinances for themselves for meat- and milk-inspection, to be supervised by the town or city officials.

Dr. Hinman: I may say that we, in the province of Manitoba, have the best laws in reference to qualifications that are necessary to enable one to practice.

I may say that some three years ago I was appointed dairy inspector of the city of Winnipeg. Up to that time there had been no inspection of the dairies. I found about 150 different people selling milk to the city. Some were residents of the city and some were not. Upon examination I found that a very large percentage of the cattle were tuberculous, and so reported to our City Council. In examining into the law which gave us authority to inspect those dairies we found that the Legislature had not provided for the in-

spection of cattle by any method other than physical means. I saw that they required something further, and with the assistance of the Legislature—and I may say that we have been very fortunate in this line, because we have from one to five veterinary surgeons in the Legislature—to get anything that we required in this line. They very kindly gave us power, and the City Council passed an ordinance authorizing their inspector to test by tuberculin or any other system, in the city of Winnipeg, whether or not the milkmen sold from the cows. I entered into this matter, and have tested in the neighborhood of 2500 cows in the city of Winnipeg, and have found a great deal of opposition to the testing of the cattle on account of there being no recompense to the owners in case of their being condemned. But we have followed very largely the process followed in Denmark. In the first place, it is necessary, under the ordinance, for a person to get a certificate before he can sell milk. That certificate must contain a report as to the health of his cattle, the suitability of his premises as to drainage, height of ceiling, cleanliness of the premises, and utensils and everything connected with his dairy. Immediately I find his animals are diseased it is necessary for him before he can sell milk to dispose of any cattle that I have branded as diseased. It is necessary for him to remove them from his premises, to get them entirely away from the balance of the cattle, and in this way I may say that we have gotten rid of in the neighborhood of 400 cows in the city of Winnipeg.

I have found that there was very slight variation in the quantity of milk that was produced by those cows, and this slight diminution I have laid largely to the test and their surroundings—that is, having strange men introducing the thermometer every two or three hours. We find that our law works very well. We find that the dairymen, previous to their purchasing cows, bring them to my infirmary for testing, and there are no cows in the city of Winnipeg that are producing milk that have not been tested. Of course, the action is only local, but the authorities should take up these matters, and I think they will in the near future. Mr. Thompson, being a provincial veterinarian from that country, can tell us about it. But the City Council of Winnipeg is protecting the people from the use of milk from tuberculous cows in this way: We simply refuse a license to parties selling milk that have not obtained that, and if they do sell without it we simply bring them up before the police magistrate and have them fined for selling milk without a license. It works a little hard, but after dairymen get it to

working in proper condition there is little expense to it for them or the city in keeping it so. We shall be glad to hear from Dr. Thompson on the question of provincial management.

Dr. Thompson: We have been paying considerable attention to this disease. My business is contagious diseases altogether.

In tuberculosis we started out a little slow; we did not force people to destroy all their animals that we found affected with tuberculosis. Our first experience to any great extent was with parties who suspected the disease in their herd, and we tested them four or five years ago with tuberculin, and destroyed them and said very little about it at the time, until our experimental farm was affected, and we so reported it to the Dominion Government, when they sent up their superintendent and we inspected their herd, and found that twenty-one out of twenty-eight reacted with tuberculin. We thought this was a very good opportunity to see whether the tuberculin-test was reliable. We thought the government could stand it to have the animals destroyed, and therefore we made a clean sweep of it and inspected them all and held a tuberculin-test. Every animal that reacted we found was affected on post-mortem, and so we continued to supply tuberculin to all the surgeons of the province, and the people are educated up to it now, and they report a case if they suspect it. They get a veterinarian to at once inspect their herd, and he tests them very cheaply; they are not allowed to charge over fifty cents up to a certain number—a dollar a head up to ten and fifty cents after that, and they soon get rid of their cattle that are infected; and we are going to have a law passed at the next session to have all foreign-bred animals—we have all thoroughbred brought in the province—tested with tuberculin before they are distributed throughout the province; and after having used tuberculin with the results I have obtained I have implicit confidence in it in the hands of men who use common sense in its application. I find that where an animal is much emaciated—where the vitality is low, where the animal is in the last stages of the disease—I find the very opposite—instead of reacting the temperature becomes lower; but where an animal may be very slightly affected, the temperature may go up very high; they say, therefore, it is not a positive test; but I can say that I have the utmost confidence in it, and, as far as affecting the flow of milk in the animals, I find that where there is a small amount given it has no bad effect upon the animal whatever.

Dr. Grange: It happens that I have been in a position to give it a good deal of consideration during the last year or so. I wish to

say, in the beginning, that I was very much impressed about a year and a half ago in reading a remark in a bulletin which came from Professor Law, in which he stated, as far as tuberculin was concerned, that those who had used it most were loudest in its praise. I do not know that those were the exact words. But I wish to say that that is the impression which tuberculin has produced upon me after having used it in about a thousand instances. One reason why it has produced such a favorable impression is because I have had an opportunity in several instances of killing over the line, so to speak—that is to say, I had a number of cattle brought before me which I regarded as being affected with tuberculosis—four in all. One cow was in an emaciated condition. She looked like an animal that was in the last stage of tuberculosis. I applied the test. I gave her a double dose. She failed to react, and I held a post-mortem on her. I failed to find tuberculosis in that cow. It appeared to be a case of interlobular pneumonia. In another instance, of a herd of ninety-seven animals, one animal on physical examination was thought to be affected with the disease, and I thought so, too. None of those in the herd responded to the test, or reacted, rather. This animal was picked out to determine whether the tuberculin was correct in all instances. She was killed; her lungs were very much affected with a disease. I am free to say that when I examined that cow—her lungs—I did not know whether she had tuberculosis or not. She had mortar-like deposits in various parts of her lungs, but notwithstanding that it looked exceedingly like tuberculosis, and there was an impression produced upon my mind that it was not tuberculosis that I had to deal with. I took some of the material of this cow and examined it as faithfully and carefully as I am capable of with a microscope for tuberculosis. I could not find any evidence of the disease. I was not satisfied with this, and I made a very free test of inoculation into two guinea-pigs of this material and some of the tissue surrounding it. In the course of two months I made a post-mortem examination upon the guinea-pigs, and I failed to find any trace of tuberculosis, or, for that matter, of any other disease; so that I was forced to the opinion that this animal was not suffering from tuberculosis.

There are one or two points that came out that are not in accordance with my views. It is with reference to the doubtful cases; that seems to me to be one of the things which should cause us to approach the systematic investigation with some hesitancy. I had occasion during last week to test a herd of cattle—fifty-seven in all

—and these animals were left in good hands for future investigation. I first of all started with what I should regard as doubtful cases. I find that French authorities claim that those that do not respond less than 2.4° are not worthy of consideration. Well, notwithstanding the statements that come from abroad, I took the liberty of taking every animal that responded at all as being a doubtful case. I placed those in three classes. Among the doubtful classes I had one poll bull, which reacted 0.1°, and of course, lacking normal, he was placed in the doubtful class. Another animal responded 1.8°. I put her in the doubtful list. There were a good many of those that responded 2°; any below that went into the doubtful list. I retested these doubtful ones again, the first test being on March 30th, and in May I tested them again. The poll bull responded a little over 2.3°. He was then condemned. The bull was killed in the course of a few days, and after a couple of days' research I found two tumors of considerable size in a region which occurred to me as being tuberculous. I made an examination of the material from these two tumors, and, not being entirely satisfied with the result of that examination, I inoculated two guinea-pigs. Both of these guinea-pigs were affected most extensively with tuberculosis in about six weeks to two months. That appeared to me to be evidence that that bull was affected with tuberculosis.

With reference to the cow, she reacted 2.5°; and to answer one question which Professor Salmon raised with reference to tuberculin on tuberculous animals, I have to say that in her case it was most marked. In the course of about two weeks that animal was reduced from a big, strong, vigorous cow to a miserable, emaciated creature. She was unable to get up, and I will say that to prevent her from dying I killed her. She was most extensively affected with tuberculosis. Her lungs, liver, spleen, mesentery, and perhaps some other parts that I do not call to mind, were very extensively diseased. It appeared to me in her case that the last injection—the second injection—stimulated the progress of the disease in a very marked manner. That is the only case I can cite where the tuberculin seemed to create an injurious effect.

In another instance there were nine animals condemned. The first case I retested—a vigorous, short-horned cow—did not respond. She responded 2.6° on March 31st. Last week she did not respond at all. All out of the nine animals that were condemned responded except that one. I have her under my supervision at the present time.

A short time ago I had the pleasure—if I may call it a pleasure—of applying the tuberculin-test to some animals which had tuberculosis in a somewhat different way from others. The case was reported to me as being a case of pleuro-pneumonia, and the history was that the animals became affected and died very suddenly. One animal was only sick about two weeks, became very much emaciated, and died. Another animal was reported as being affected at that time, and was running down, as they told me—was going in the same path as the previous one. I went up and applied the test and found several of these animals affected with tuberculosis. I took a lot of the material of this cow that was running down back to Lansing to find where the germs went into the milk, and reduced this to about twenty gallons of milk. To see what the effect on guinea-pigs would be I inoculated several of them, and I found that all of them died within about twenty-four hours—a very short period. Well, the question arose as to what the cause of the trouble was, and we found there a germ—green pus—which seemed to destroy the guinea-pigs. There was considerable of this green material in the lungs of those cows to which I applied the test. I became impressed with the idea that the reason why these cows developed this disease and died so quickly was that this other germ had assisted this tuberculosis and it was really it that carried them off so quickly. That may or may not be the case, but that was the impression which it made upon my mind.

The President: There is one here who has taken a very special interest in this, and has held up the work with a strong pair of shoulders, and who has for a great many years studied this through a microscope, and been trying to devise ways and means of dealing with this subject, and has developed some very curious ideas in regard to dealing with it, and the relation of the public to the milk- and meat-supply. I am pleased to call on Dr. Clement.

Dr. Clement: It is true that we know very little more about this now than we did some time ago, and it seems to me, further, that if the money paid out in trying to eradicate the disease were spent in other ways the results would be more fruitful. I think we should by experiment in some manner demonstrate to the public the probabilities or possibilities of infection of human beings, if you like, through the milk of tuberculous cattle. It seems to me that if under the management of the United States Government large numbers of tuberculous cattle could be gathered together under one roof or on the same farm and have their own attendants, and if then a large

number of small animals were fed upon that milk for a given time, it might possibly be determined as to what percentage of those animals became infected by using the milk of tuberculous cattle; then if we found that on this magnificent scale of experimenting the percentage was only a fraction of 1 per cent. or something very small, I think the public should know it. I think this organization should give the public as definite information as possible, and if they are being frightened they should know it. But if, on the other hand, the danger is great, and infection with tuberculosis from eating the meat and drinking the milk is frequent, they should know it. But the present method of eradication seems to me—I may be mistaken, but it really seems to me—like quarantining the United States against the introduction of cholera in some obscure port and leaving the others wide open. I think it is a matter that should be looked into and should be controlled, but I rather hesitate to believe that the State should foster a method which is so largely police in its nature. I think that probably as good results might be obtained if the public sentiment was so aroused that the public would compel the producer to prove that the food that he furnished was what he advertised—was pure milk if he does so advertise. I think undoubtedly that the State should exercise a certain police supervision over this matter. I think every man who advertises pure milk should use every means at his command and at the command of science to assure the public that it is pure. Such an assurance would be given by the certificate of a veterinarian or a medical man that the herd had been inspected and pronounced free from disease.

It seems to me, however, that the State through its officers should indorse that certificate; that that certificate should not be indorsed by the State unless the State had confidence in the inspector and more especially in his honesty. It seems to me that a small appropriation from each State would suffice to conduct this work in a proper manner; and while it would not compel farmers to have their cattle tested, it would compel them to transact their business in a legitimate manner, so that they could not sell anything but pure milk. It seems to me that we could obtain statistics in a few years which would form a basis for further police interference. As it is now, large appropriations are made, and it is quite possible that after this vast amount of money has been spent the mortality in human beings will not be decreased. I think these are matters which should be looked into, and some means should be fixed upon so that the danger to human beings from the consumption of milk and meat

could be shown. We have a great deal of discussion as to where the lines should be drawn. All that discussion, in my opinion, has been based upon purely individual opinions regarding the subject. One man thinks this and another man that. One thinks that animals infected with the disease in certain glands should be killed, and another man only cattle which are badly affected. I am just as interested as anyone in this matter, but I think perhaps a more conservative method might be fraught with better results.

Dr. Pearson: I notice two things in Dr. Clement's talk that pain me exceedingly. The first one is that one of our brightest members has taken a retrograding step, and the second is that he has failed to keep up with modern scientific advancement.

Dr. Clement complains that no experiments have been tried upon man to determine the exact effect. (Interruption.) I do not wish to misrepresent Dr. Clement, but his assertion is that no experiments have been made to determine the effect upon the public of using the products of tuberculous herds. We cannot take a man and lock him up in a cage, in a laboratory, and feed him milk from tuberculous cows, or we could determine positively the effect of tuberculous milk upon human beings; and, therefore, we have to gain our information from two other sources: Feed it to animals and observe the effect upon these animals; and, in the second place, observe the effect upon the public as we can, and obtain as much information as we can from that. We all know that there are cases of experiments on record in which cattle having tuberculosis in various degrees, supplied milk which has been fed to animals of various kinds—to pigs, calves, rabbits, guinea-pigs—and we have evidence that cannot fail to convince anyone that the milk from tuberculous cows will cause tuberculosis upon the animals fed from that milk. Now, the question arises as to what cows will give tuberculous milk that will infect animals fed upon it—cows that have tuberculous udders will. In some cases cows having tuberculosis in other parts of the body, the udder being healthy, supply milk that is virulent and produces tuberculosis. In others the udder may be tuberculous, and no tubercle bacilli can be discovered in the milk with the microscope. But we must remember that tuberculosis is not a stationary disease. It is not a disease that tends to recovery. It is true that men do sometimes get well, but that is the exception. In a vast majority of cases it is progressive and tends to cause death.

Now, when we know that an animal has tuberculosis, and we do not know where that tuberculous region is, are we justified

in allowing that animal to produce milk and furnish it to the public? We do know that the disease the next day, the next week, month, or year, may have progressed in that cow to such an extent as to render the milk extremely virulent and dangerous. Now, knowing this to be so—we know that a cow remains in the dairy and is diseased in this way—how we can argue a question like that I cannot see. We must remove the possibility of human contamination.

Dr. Clement remarks that this should be done at the expense of the owner. If it were not of public importance, I think everyone would admit that this is the right view; but is it not of public importance to have as pure a food-supply as possible, and especially where it is sold in cities and is the sole food of infants, invalids to a large extent, and is a very important food of healthy people? If it is not a public matter, certainly the drainage of cities and the provision of pure water for cities are not public matters. If it is not of public interest to have a pure milk-supply, it is not a public interest to enforce any health measure whatsoever. I think the reasons are just as strong as for enforcing any other sanitary measure that tends to restrict disease and promote the public health. So, this being a public measure, why should a farmer be forced to bear the expense of the test and suffer from the loss of the diseased cows? If the farmer had been responsible for the introduction of tuberculosis in his herd, it would be entirely different; but the farmer in nearly every case bought the cows with the disease. He would not have purchased these cows that were tuberculous but for the lax measures regarding these matters. He introduced the tuberculosis unknowingly. And, further than that, farmers are poor; they cannot afford to be forced to do it. We would be without milk producers if they were obliged to do this.

On the other hand, if the farmers could afford to do it, and did it, it would be a great expense to them, and the price of milk would be raised greatly; and if the farmers were to bear the expense of extermination, it would raise the price of milk from six cents a quart, which is the price they pay in Philadelphia, to fifteen cents a quart, perhaps, and this would remove it from the reach of poor people who need it most, and the public would suffer in that way; and that is another way in which the extermination of tuberculosis becomes a public matter.

I think, Mr. President, that it is extremely unfortunate that any views of this sort that Dr. Clement holds have been expressed in this meeting. Of course, they are not indorsed by the meeting.

To-morrow the committee appointed for that purpose will submit resolutions and the convention will be asked to indorse these, and I cannot for a moment think that suggestions similar to those expressed by Dr. Clement will be considered.

Dr. Clement: It seems to me that a false interpretation has been put upon my remarks. I never thought of such a thing as experimenting on man.

I said this: that the evidence as to the frequency of infection was not sufficient; and I said I thought that, if a series of experiments on a large scale were performed by the feeding of smaller animals, the data so obtained could be applied to the possible infection of people by the milk; that is to say, tuberculosis in people and animals being identical, the ratio of infection might be the same in one as in the other. I had no idea of experimenting on human beings. My idea is in the main the same as that of the meeting, but I differ a little from some members as to methods. I think, if possible, we should get as many data as we can; and while, as Dr. Pearson says, there are a great many experiments made, I do not think there have been any experiments made on a sufficiently large scale to establish the ratio of infection. I think it is due to the public that somebody should conduct such experiments. So far as its being a matter of public interest in regard to the milk-supply, I fully agree with the doctor, but is it not admitted by all of those who have spoken that it is next to impossible at the present time, by any legislation that can be obtained, to make any impression toward the eradication of this disease in cattle? I think that encouraging a demand for pure milk among people would control to a great extent the milk-supply and improve it greatly. I am sorry that my remarks should have made such an impression upon the convention, for I am sure I am in accord with the sentiment prevailing here in regard to this matter.

The President: For a long number of years it has been supposed that the existence of tuberculosis was in the Eastern States, but recent investigation in the West have proven that it also has a foothold there, and it has created a great deal of concern among the dairymen of Western States, and I know of no one who has given more thought to the matter than our friend and fellow-member, Dr. Stalker.

Dr. Stalker: We have had some of this difficulty in Iowa, and from the observations which we have made there, and from the observations made by others, and the cases that we have had reported from the various portions of the country, I think we can congratulate ourselves that quite a little ground has been cleared of

rubbish, and that preparations have been made of the more practical solution of the main problem. I believe it is practically settled, in the mind of every scientific man, that consumption and tuberculosis are one and the same thing. I believe it is settled in the mind of every scientific man that this is an infectious disease; that the bovines are most subject to this disease, and that milch cattle, above all others, are subject to it. That milk from tuberculous cows can and does convey the disease to susceptible people—that is, it is very liable when the udders are affected, and that it will convey the disease where it was entirely free from the tuberculous deposits—has been proven by very careful scientific men. That the flesh of tuberculous animals, the juices from it, may convey the disease, I believe has been demonstrated. That the disease is widespread through the country every man knows, and that our dairy herds are very seriously affected is a matter of common knowledge with everyone who has had practical experience with this subject. This and other facts have been settled in regard to it.

Now, as to the practical method of dealing with the question how we should dispose of this stock, what methods of protection shall be employed, there will be differences of opinion. They will differ in different sections of the country, depending upon the different amounts of it in the section, and many facts will have to do with the opinions of the men. I am best acquainted with conditions at home, of course. We have a territory of 53,000 square miles in the State of Iowa, and a bovine ownership of a million milch cows alone. I think no man any longer questions the reliability of the tuberculin-test, and in the present state of science this is the only method known by which the disease can be recognized in all its stages. This is my experience with its use, and I believe it is the experience of every gentleman who has pretty extensive experience with it. As to the method employed in our own State, when I was in charge of that work, as I was up to within the present week, I have attempted to introduce methods that I believed would be sustained and borne out by the public; but to attempt to apply the tuberculin-test to two millions of cattle is a pretty large job. It is impracticable, I believe. I have recommended in our own State that we control the disease in our dairy herds and in the breeding farms, as it may not be practicable to at once undertake the whole investigation and test of the herds.

The law in our State is that when any local board of health becomes aware that there is in existence any infectious or contagious disease they have a right to call on the State for inspection. The

State furnishes the inspection without any expense to the owner. We have the right to condemn and destroy. My policy has been to inspect all herds that were reported as suspicious. After having made the test I have given the owner the choice of voluntarily consenting to the destruction of the diseased animals or placing them in quarantine. In nearly every case the owners acquiesce that if they have cattle that are infected with the disease they are willing to have them destroyed; and it is remarkable in the great majority of cases that, rather than have the cattle placed in quarantine, they would have them destroyed, and in the post-mortem examinations they nearly universally express themselves as being more than satisfied with the results. In this way we have succeeded in eradicating the disease from several hundred dairy herds. These herds have shown a rather high percentage. In some herds 15 or 20 per cent. of them have proven to be tuberculous.

In one or two localities we have made more extensive investigations. In one town of about twenty thousand inhabitants all of the cows were tested that were supplying milk to the city, both in and out of the limits. Out of some thirty-odd herds that were tested only one of them was known to contain some sort of disease—all of the others were entirely free; and it is my belief that this would be about the state of affairs through the country if some system were adopted so that an attempt to conduct a close examination would imply the examination of a very large amount of animals where no disease exists.

The greatest danger, I believe, is in the dairy herd; and if every herd against which there can be any suspicion, and if all breeding farms can be placed under test, then the principal means of distributing the disease over the country will be cut off. I have found in practically every instance where I have conducted these examinations that the owner is able to trace the history of this disease in the purchase of bulls and cows for their dairy herds, and that has been the source of it; and if these dangers be cut off the disease would be very materially restricted, I think.

I am sorry that opinions such as have been expressed here by one gentleman, at least, have found their way into this convention. The objector always seizes on opinions of that kind, no matter how they are expressed; whether it is a firm conviction in the mind of one who gives utterance to them or not, the objector always seizes on to that as being the highest opinion of the whole body. It is a very bad policy to go into prayer-meeting with a prayer to the Almighty if there is one, to save the soul, if there be one.

TUBERCULOSIS OF BIRDS.

By D. E. SALMON, D.V.M.

Avian tuberculosis is a disease with which the American veterinarian is not very familiar. Our profession has not often been consulted in this country concerning the diseases of birds, and a smaller proportion of the establishments slaughtering these animals are inspected than those of slaughtering cattle and hogs. We should expect, therefore, other things being equal, to have less knowledge of this subject than of the tuberculosis of the larger animals. Another reason for our lack of literature will probably be found in the comparative freedom of our poultry from this disease.

In Europe avian tuberculosis appears to be very frequently encountered. There are many accounts of it, but we can only accept those recorded since the publication of Koch's researches in 1884, as the diagnosis before that time is open to serious question. Koch demonstrated beyond doubt the occurrence of tuberculosis in fowls, and observed that the bacilli were extraordinarily abundant in the nodules of the intestines and liver, and that they were also found in large numbers in the contents of the intestine.

Sutton observed tuberculosis in grain-eating birds of various parts of England from 1879 to 1885, and states that "the occurrence of tuberculosis in these places may be regarded as showing that it is probably met with in most parts of England." Nocard says: "Tuberculosis is a frequent disease with birds of the poultry yard. It occurs with them in an epidemic form. It attacks fowls, pheasants, pigeons, turkeys, peacocks, guinea-fowls, etc., and even the small birds may contract it experimentally." In 600 autopsies of fowls made by Zürn sixty-two (10 per cent.) were found tuberculous.

This disease has been frequently reported in the United States, but in some cases the diagnosis was almost certainly incorrect, and in most others it is open to more or less question. Bray, of Kansas City, has recently recorded cases, but apparently no bacteriological

examination was made. He refers to an outbreak which he thinks was caused by the ingestion of expectorations of a tuberculous man, and as this brings up the question, still contested, of the transmissibility of human tuberculosis to birds, we will not discuss this diagnosis at present.

Symptoms. The symptoms of tuberculosis in birds are obscure and not to be relied upon in making a diagnosis. There is a rapid and progressive emaciation, made apparent by the loss of weight, wasting of the muscles, particularly of the pectorals, prominence of the bones, and sharpness of the sternum. The comb becomes pale, the bird loses its animated appearance, and in the later stages may become somnolent. At this time a persistent diarrhœa appears, which increases in intensity until the subject dies from exhaustion.

The symptoms just enumerated are those observed when tuberculosis affects the internal organs. Often it is localized in the joints and bones, when it is revealed by lameness, articular swellings, and deformities of the bones. Occasionally there is ulceration, the pus of which contains many bacilli.

Lesions of the external mucous membranes and skin are frequently observed with parrots, but are rare with other species. They begin as small, grayish elevations which unite and form patches. On the surface of these patches are found thick crusts, hard externally, and soft and cheesy next to the tissues. If these crusts are detached, a red, granular surface is exposed. Sometimes the crusts, particularly near the eye or mouth, become horny and develop into excrescences several centimetres in length.

Pathological anatomy. The lesions in pheasants and poultry are generally found in connection with the abdominal viscera. The liver is most frequently and most severely affected. It is enlarged and filled with tubercles of various sizes, from whitish points to nodules as large as a pea. Sometimes there are large, round tumors, fibrous, firm, or softened at the centre, which may reach the size of a walnut. The tissue of the liver is more friable than in health, and ruptures leading to fatal hemorrhage sometimes occur.

The spleen is often invaded with small, whitish tubercles, and it occasionally contains large, hard, irregular, and calcareous masses.

Miliary tubercles are frequently found on the peritoneum, in which case ascites is also observed.

The intestines are often affected with infiltrations, miliary tubercles, nodules, and sometimes with large, tubercular masses in the walls, which diminish the calibre of the tube or entirely obstruct it.

The softening and breaking down of the tubercles on the mucous coat cause the ulcerations which are commonly seen in this disease, and from which the bacilli are disseminated in incalculable numbers.

The abdominal glands may be invaded and enlarged to the size of an egg.

In the lungs, air-sacs, heart, and pericardium are sometimes found miliary tubercles or caseous masses, but these organs are more rarely the seat of tubercular deposit than are those situated in the abdominal region.

The joints or the surrounding tissues are frequently the seat of inflammation leading to the formation of tubercular deposits, abscesses, ulcers, or fistulæ, from which ankylosis is a common result.

Generalized tuberculosis is not rare in which most or all of the organs of the body are affected, the tubercles being found even in the interior of the bones.

Lesions of the mucous membranes of the mouth, larynx, sinuses, and conjunctiva occur which were formerly attributed to avian diphtheria; but these, as well as certain horny tumors of the head and feet, have been shown to contain large numbers of tubercle bacilli. Some external lesions are the rule with parrots (the *Psittacidæ*).

Pathogenesis. The disease among poultry generally follows the introduction of new birds into the flock—that is, it results from contagion carried by diseased birds. Many outbreaks have been attributed to infection by the ingestion of human sputum. The possibility of such infection, although admitted by some authorities, is denied by others. It is certain that birds are not so easily infected experimentally with the tuberculosis of mammals, although this is sometimes accomplished. A careful study of the recorded evidence leads to the conclusion that avian tuberculosis is not an entirely distinct disease, but that by passing it for a number of generations through rabbits or other mammals it gradually acquires the characters of the ordinary tuberculosis. We cannot, therefore, deny the possibility of the infection of poultry by the sputum of human subjects, though we must admit that this does not occur as readily as some have supposed.

When Koch demonstrated in the lesions of fowls tubercle bacilli similar to those found in mankind, the identity of avian and human tuberculosis appeared to be established. His researches were promptly confirmed by Ribbert, Babes, Cornil, and Megnin. Nocard and Lemalleree published observations tending to show that poultry

might contract tuberculosis by the ingestion of tuberculous sputum from human patients. The results of these researches all appeared harmonious, but they were soon followed by the experiments of Martin, who inoculated fourteen hens, two cocks, and two pigeons in the abdominal cavity with human tuberculosis without producing tubercles, and by those of Strauss and Wurtz, who fed tuberculous sputum to six hens and a cock for a period of six to twelve months, and at the end of this time found the birds were perfectly free from tubercular lesions, as shown by a careful post-mortem examination. The experiments of Rivolta, which soon followed, showed that there were very decided differences between the tuberculosis of fowls and that of animals. He pointed out that if guinea-pigs were inoculated with the tuberculosis of fowls, this did not lead to a general infection, but only resulted in an abscess at the point where the virus was introduced. It is, of course, well known that guinea-pigs are very susceptible to mammalian tuberculosis. He found that inoculations with rabbits led to similar results, although with this animal there might be developed a few tubercles in the lungs.

This interesting study was taken up by Maffucci, who found that fowls died with generalized tuberculosis if they were inoculated into the peritoneal cavity or veins with the tubercular products of another fowl. He confirmed Rivolta's conclusions as to rabbits, but stated that with guinea-pigs the result varied according to the manner of introducing the virus. If the inoculation was made in the subcutaneous connective tissue, the animal generally resisted after having had a local lesion. In other cases the animals died with marasmus at the end of five months. The autopsy showed atrophy of the liver and spleen, but no tubercles or tubercle bacilli. With intraperitoneal inoculations the guinea-pigs may die in from fourteen days to three months. In the case of rapid evolution the organs are infiltrated with embryonal elements and contain bacilli. In the cases which develop slowly there is only found atrophy of the liver and spleen. If the inoculation was made into the lung, it caused interstitial inflammation, the bacilli remained there, and did not invade the abdominal viscera. If the inoculation was intravenous, the guinea-pigs died in fifteen, twenty, or twenty-five days. Microscopic examination showed the liver infiltrated with embryonal elements, and contained numerous bacilli. Finally Maffucci concluded that mammalian tuberculosis was not transmitted to poultry. He inoculated twenty fowls under the skin, in the stomach, the lung, the peritoneum, and the veins. All resisted.

At the Berlin Congress, Koch announced that he had given further study to the subject, and he could not completely identify the tuberculosis of poultry with that of man.

Cadiot, Gilbert, and Roger, working together, have made eighty-five experiments, one series having been in progress nearly five years. In these they include fourteen fowls, seventeen rabbits, fifty-two guinea-pigs, and two dogs. They conclude that the tuberculosis of poultry is transmissible among fowls—inoculation in the veins or peritoneum being followed by a generalized tuberculosis which is soon fatal. The rabbit readily contracts avian tuberculosis, and death results in two or three months from generalization of the infection. The guinea-pig, which is more sensitive than the rabbit to human tuberculosis, is less susceptible than the latter to avian tuberculosis. It is the exception to see general infection in guinea-pigs as a result of inoculation with the tuberculosis of the gallinaceæ. In nearly every case there is either no tubercular lesion or there is a local, curable lesion at the point of inoculation, or the visceral infection is slight, discrete, and tends to recovery. The inoculation of the gallinaceæ with mammalian tuberculosis generally fails to produce fatal results. In most cases it is well supported, but in a few cases it excites some temporary disorder about the end of the second month, and in a few rare cases it causes an eruption of tubercular granulations in the viscera.

These investigators have also found that after passing the avian tuberculosis through a number of mammals it may become very virulent for the guinea-pig and cause with this animal the development of visceral tubercles as does mammalian tuberculosis. At the same time it may lose its virulence for the gallinaceæ, and become pathogenic for the dog, which is immune to direct inoculations. Notwithstanding the long periods during which the inoculations were continued, the virus had not become fixed and uniform in its action. Hericourt and Richet have shown that avian tuberculosis is not communicable to monkeys either by subcutaneous or intravenous inoculation.

Bacteriological study has also shown notable differences in the germs of avian and mammalian tuberculosis. The germs of the avian form stain in the same manner and develop on the same culture-media as the other. They are in general somewhat longer, more granular, more vigorous, and more resistant to destructive agencies. They develop more readily on artificial culture-media, and grow at once on glycerin-agar, while the human bacillus only

develops on this medium after having been cultivated several times on serum.

The avian cultures are more moist, oily, corrugated, and soft; those from man are dry, scaly, verruciform, dull, and hard. The avian bacillus grows at 43° and resists at 65°, while the human bacillus ceases to grow at 41° and is killed at 65°. An avian culture six months old is still alive, vigorous, and new cultures may be made from it, while the human culture of the same age has lost all power of vegetation.

These facts are sufficient to show that there is a very marked difference between the tuberculosis as we find it affecting the gallinaceæ and that which is found in mammals; also, that it is quite difficult to infect poultry with mammalian tuberculosis, and not less difficult to infect most mammals with the tuberculosis of poultry. By far the greater part of the experiments for transferring the disease in either direction are absolute failures.

A very important point brought out by Cadiot, Gilbert, and Roger, and by Strauss, in recent investigations, is the difference between the tuberculosis of parrots and that of the gallinaceæ. Parrots are very subject to tuberculosis. Froehner reports that 154 of these birds treated at the Berlin veterinary school, from 1885 to 1893, 56, or 36 per cent., were tuberculous. Cadiot observed that of 35 parrots brought for consultation to the Alfort school 11 had tuberculous lesions. The chief characteristic of the disease with parrots is the frequency of lesions of the skin and of the mucous orifices. Such lesions are seldom seen in poultry and pheasants, in which the tubercles are for the most part found along the digestive tract and in the abdominal viscera.

The disease in parrots may be compared to certain forms of lupus. The lesions generally exist about the head, particularly on the cheeks, the peri-orbital regions, the commissures of the lips; they are frequently found on the buccal and lingual mucous membranes, and sometimes on the limbs, wings, or other regions of the body.

In the beginning the feathers drop from the affected part, the skin is thickened, becomes warty, and covered with crusts. Sometimes horn-like productions form, which may reach 1 to 5 centimetres in length and 1 to 2 centimetres in breadth at their base. Ulcerations are common, and sometimes tumors the size of a cherry, of a fibrous character, are found in the subcutaneous tissue. Later these soften at the centre and become caseous. When the feet are affected, swellings and deformities are seen. On the mucous mem-

branes lesions are seen similar to those of the skin; they are gray or brown, hard, conical, or round elevations, which may considerably interfere with deglutition. The evolution is extremely slow, and unless they seriously interfere with the necessary functions of the organs life may be prolonged for years. Sooner or later, however, the birds become sick, cease talking, and die of emaciation and exhaustion. The post-mortem examination sometimes shows the internal organs to be free from infection, while in other cases the liver, spleen, and lungs are studded with tubercles, and even the joints and muscles may be affected.

The experimental study of this disease is very interesting. When guinea-pigs are inoculated from the lesions of the parrots, they contract generalized tuberculosis. Rabbits are less sensitive than guinea-pigs; dogs are susceptible; and fowls are not affected by it. These are the characteristics of mammalian tuberculosis.

Experiments have also shown that parrots are easily infected with human tuberculosis, and that the lesions produced in this way are similar to those seen in the spontaneous cases. In seven cases an investigation by Cadiot, Gilbert, and Roger indicated that the parrots had been contaminated by people. It appears, therefore, that the tuberculosis of parrots is often, if not always, of human origin. The bacilli are very virulent for certain mammals, as is shown by inoculation. The bacilli are found in enormous numbers in cutaneous productions, in the saliva, the nasal secretion, and sometimes also in the excrement. These germs are easily disseminated, and the parrots which receive their infection from man become in turn permanent centres of infection in the dwellings where they are maintained.

An observation indicating still further the danger to mankind of contagion from certain birds was recently recorded by Durante. The subject, a woman, seventy-one years old, without any previous history of disease, was seen among the patients of that well-known hospital, the Hotel Dieu. This woman had lost a daughter of tuberculosis in 1885, and was living with another daughter aged thirty-five years, who was rhachitic and probably tuberculous. In 1890 she was presented with a sparrow. In 1892 this bird, which had previously been in good health, appeared to be ill; it became dejected, irritable, and one day pecked its mistress at the root of the thumb nail with sufficient force to cause slight bleeding.

The illness of the bird continued, and it finally died without the nature of its disease having been determined. Five or six months

after receiving the slight wound the woman noticed a crust forming at the injured point. As this lesion continued to develop, she came to the Hotel Dieu for treatment in April, 1894.

She was found to be affected with an absolutely typical lupus which had invaded two-thirds of the dorsal surface of the second phalanx of the thumb. There existed in addition a secondary nodule the size of a pea at the middle part of the anterior surface of the forearm, and two smaller ones in the fold of the elbow-joint. The lupus was treated by actual cautery and the woman appeared completely cured in December, 1894. The nodule in the forearm was extirpated and divided into two parts. One portion was examined histologically and showed the characteristics of tubercles, with numerous giant-cells, but it was impossible to stain the bacilli. The other portion was used for the inoculation of a guinea-pig, which died of generalized tuberculosis. From the spleen of the guinea-pig there were inoculated a pigeon, which was sacrificed at the end of a month and found free from lesions, and a rabbit which died at the end of a month of generalized tuberculosis. The woman was, therefore, affected with mammalian tuberculosis.

As no examination was made of the sparrow, it could not be positively affirmed that it was affected with tuberculosis; but the fact that it was affected with a chronic and fatal disease and the development of the lupus at the point injured by the bird's beak are strong presumptive evidence that it was suffering from this disease. As the tubercular lesions with birds are frequently localized at the commissure of the beak, and as the saliva may contain numerous bacilli, it is easy to understand how the inoculation might occur.

Whatever may be our views, therefore, as to the identity or the quality of the tuberculosis of mankind and of the gallinaceæ, it is demonstrated beyond question that certain cage-birds may contract human tuberculosis and become centres for its dissemination. This is a most important fact for veterinarians, for sanitarians in general, and for the public to recognize.

From what has preceded it is plain that outbreaks of tuberculosis among poultry and pheasants must in most cases be caused by infection from other diseased birds. The infection of individual birds by mammalian virus must be considered possible, but from our present knowledge we can hardly admit that virulent outbreaks among poultry can originate in this manner. On the other hand, tuberculosis of the gallinaceæ cannot be considered as very dangerous to mankind. Certain birds, such as parrots and other cage-birds,

may, however, contract human tuberculosis, and in turn communicate it to mankind and other mammalia.

A study of the lesions in avian tuberculosis indicates quite plainly that the virus is taken into the body through the digestive tract. The location in the intestinal walls, liver, spleen, and abdominal glands, and the general freedom of the lungs from the tubercular process, make this conclusion almost incontestable. Parrots, on the other hand, are usually infected by the deposit of bacilli, probably from the atmosphere of the apartment, upon slight abrasions or wounds of the skin or upon the mucous membranes. When the mucous surfaces of the intestines of birds are affected, the bacilli multiply enormously, and the excrement becomes a very active source of contagion. As birds eat more or less of their food from the floors of their houses, or from the ground where they have been running, and where it is soiled with droppings, and as the drinking-water readily becomes contaminated by the beaks and feet of the birds, it is readily understood how the introduction of a single tuberculous bird may soon infect all the individuals in a poultry yard or pigeon cote.

Zoological distribution. Sutton, writing in 1886, stated that in 1881 he began to attend systematically at the Zoological Gardens, London, and found this disease to be excessively common. Beginning with the summer of 1883 the diagnosis was made on the results of bacteriological examinations. The average mortality among the birds in the gardens was about one hundred per month. He states that tuberculosis was almost peculiar to graminivorous and fruit-eating birds and vegetable feeders. It occasionally occurred in birds of prey, and was suspected in these cases to have resulted from feeding on smaller birds affected with the disease. The common fowl —the peacock, guinea-fowl, grouse, pigeon, and partridge—were found to be especially liable to tuberculosis. The rhea, or South American ostrich, was also very subject to it, as twelve of these birds were affected out of thirteen which died in the gardens. Water fowl and birds which live upon fish appeared to be exempt from its ravages. Storks and cranes contract it, and Hobday has recorded cases in the ostrich.

Diagnosis. There are a considerable number of pathological conditions found in birds which may be mistaken on ordinary post-mortem examination for tuberculosis. The air-sac mite (cytodites nudus) penetrates the trachea, bronchi, and air-sacs even to the cavities of the bones. They may be encysted and form rather hard

miliary nodules, and they have even been found in nodules the size of a pea, situated in the lungs, kidneys, and liver. The connective-tissue mites (*laminosioptes cysticola*) are frequently found in the subcutaneous connective tissue of the neck, breast, abdomen, flanks, and thighs. When one of these parasites dies, its presence acts as a foreign body, provoking the formation of a miliary nodule, which soon becomes calcareous. Large numbers of such nodules may be encountered in the connective tissue of the parts mentioned. The *falciger rostratus*, a feather and connective-tissue mite of the pigeon, under certain conditions penetrates into the subcutaneous connective tissue, the peritracheal tissue, and even the visceral cavities, causing lesions similar to those mentioned as due to the mites of the gallinaceæ.

Nodules of the intestinal walls of fowls are caused by a small tapeworm (*tænia bothrioplitis*, Piana), and may be mistaken for lesions of tuberculosis. They are one-sixth of an inch or less in diameter and contain a greenish-yellow necrotic substance.

A form of coccidiosis caused by the *gregarina avium intestinalis*, Rivolta (*eimeria dubia*, Railliet), affects the intestines of fowls and some other birds. It is described as greatly resembling the diphtheria and the tuberculosis of birds. Cornil and Megnin class this affection as tuberculo-diphtheria. It appears as small, whitish points in the submucous coat of the intestine, or as a diphtheritic inflammation.

The *cercomonas hepatica*, Rivolta, causes the formation of yellowish nodules throughout the liver, varying from the size of a pea to that of a hazelnut. This disease has been observed in pigeons only.

Poultry, pigeons, pheasants, parrots, and various other birds suffer from mycosis of the trachea, bronchi, lungs, and air-sacs, due to the *aspergillus glaucus*, *A. nigrescens*, *A. fumigatus*, and to the *mucor racemosus*, in which there are produced numerous yellowish nodules varying in size, which might easily be taken for true tubercles. These are at first soft, but later become more firm and hard. They may also be found softened and caseous or even calcified.

In chronic cholera caseous centres may be found in the liver, which closely resemble in appearance the lesions of tuberculosis.

Diphtheria of the intestines has been confused with tuberculosis, but should be easily recognized by the stratified false membranes which differ radically from the ulcerations of tuberculosis.

All of these different conditions should be borne in mind, because

any of them may be met with in post-mortem examinations of birds. A bacteriological examination and the discovery of the *bacillus tuberculosis* is the only certain and reliable post-mortem evidence upon which a diagnosis can be made.

According to Nocard, tuberculin may be successfully used to diagnosticate the disease with very valuable birds. He places the dose at 5 to 10 centigrammes for fowls, pigeons, and pheasants, and 10 to 20 centigrammes for geese, turkeys, and peacocks.

It is sometimes desirable to decide definitely whether a bird or a mammal is affected with avian or mammalian tuberculosis. This is determined by the inoculation of guinea-pigs subcutaneously, fowls and pigeons in the peritoneal cavity, and dogs intravenously. For confirmation of the results of inoculation bacteriological studies may be made, but are only necessary in research work where the greatest accuracy is essential.

Treatment. The eradication of avian tuberculosis can only be attempted with a fair prospect of success when all the birds are sacrificed. Any individuals that are preserved are liable to have ulcerations of the intestines from which the bacilli are constantly distributed. There should, consequently, be no attempt to save any of the birds from an infected flock.

When the birds are all properly disposed of the premises should be thoroughly disinfected. The manure should be carefully scraped and swept together and saturated with a 2 per cent. solution of sulphuric acid. The floors and woodwork of the houses should be washed with boiling water, and after drying they should be saturated with a solution containing 5 per cent. of crude carbolic acid, or 3 per cent. of creolin, or one per thousand of bichloride of mercury. Any yards which are used for penning the birds should be well sprinkled with one of the same disinfectants. The feeding-troughs, drinking-vessels, and nests must of course be disinfected as well as the houses and yards.

After the cleaning and disinfection are accomplished the premises should be open to the sun and air for a month if possible before new birds are introduced. The bacillus of avian tuberculosis is much more resistant than that of human tuberculosis, and for that reason every precaution must be adopted to secure its destruction before the place is restocked. Cultures of avian tuberculosis mixed with sterilized water from the Seine were still virulent after fifty-two days at 8° to 12°, and after sixty-six days at 15° to 20°. At 70° C. it is killed in ten minutes. These data emphasize the neces-

sity of careful disinfection and of allowing some weeks for sunlight and desiccation to aid in the process.

When the premises are being restocked care should be observed to receive birds only from healthy flocks, and it is well to quarantine these for at least thirty days. In building up valuable flocks this precaution is always advisable as a protection against the various forms of contagion that one is liable to introduce.

The danger of introducing tuberculosis by the sputum of human subjects is apparently not very great; and yet it is well to keep people who are affected with the disease away from the poultry yards and chicken-coops. The possibility of the disease being contracted by poultry from this source having been demonstrated, it is the part of wisdom to take such precautions as are required to guard against it.

DISCUSSION.

Dr. Osgood: I am very much interested in the paper, and feel that it is of the utmost importance to us at the present time to consider this subject; and especially so if we look to the eradication of tuberculosis. In our discussion in the Legislature this point has often been brought up in regard to tuberculosis of cattle and other animals when we were trying to get some legislation on the subject. They say, "What is the use of trying to exterminate tuberculosis when the poultry yard would again introduce the disease?" And I think that anything we can learn in relation to the poultry yards or the tuberculosis of birds is of the utmost importance in the consideration of the eradication of this very prevalent disease.

Dr. Knowles: In regard to the remarks that were made about the importance and vast proportions the industry of birds and fowls has reached, I saw statistics going to show that the poultry business leads by many thousands of dollars that of beef or pork. It seems strange, but it is true.

Dr. Winchester: I think I have seen in print a statement that the industry of egg-production represents more capital than any one industry in the United States.

Dr. Lyman: I am glad that the subject has been so ably treated, and I hope that some endeavor will be made to get this paper published and have it given the widest circulation possible. It seems to me that the necessity for this is very great. We keep hearing—

in Massachusetts, at any rate—the reports that hens have become infected with tuberculosis from the other animals and from persons, and a great long tale connected with it, all of which have no foundation in fact. I will also say that the State laboratory in Massachusetts has been engaged for a long time in experimental research. It was taken up because of the many reports of the transmission of the mammalian tuberculosis to birds. So far, I do not care to discuss here from memory the exact methods that have been undertaken in the laboratory in that work, but I can say that through the inoculation of mammalian tuberculosis in birds their efforts have been entirely unproductive of results.

Dr. A. T. Peters: The Secretary of the Relief Commission of Nebraska of 1894 reported to our department that in the western part of the State a great many people only requested corn for food for their hens—that that kept them alive; and the drought of 1894 has taught the farmers of Nebraska a great lesson. Heretofore the farmers and the public in general thought that the poultry industry was a small one. The Nebraska Experiment Station has stimulated the feeling in our State to send in the birds when they are sick or if they are dead, so we can get hold of them and hold a post-mortem and get statistics; and I will say that in 1895 our department must have received, dead and alive, somewhat over 500 birds, sent in from all over the State. We are gathering quite a little information on this subject, and we intend to do quite a little more this year.

"SOME EXPERIENCES IN THE SOUTH."

By W. H. DALRYMPLE, V.S.

Mr. President and Gentlemen: When first asked by our worthy Secretary to prepare a paper for this meeting I hesitated, principally on account of the lack of time, partly on account of the trouble, and to some extent because it was extremely doubtful whether I would be able to be present to read it. However, after a second persuasive letter from Dr. Stewart, in which he mentioned the fact that several gentlemen were coming long distances from both North and West to contribute to the success of the meeting, and that he felt sure that something in the nature of a Southern experience would prove interesting to our Northern and Eastern brethren, I felt constrained to yield to his appealing request.

I trust, gentlemen, you will not feel disappointed when I tell you that I have not confined myself to the discussion of any one specific disease. It occurred to me that as professional work in the South, especially in my section of the country, might be new to the majority of you, a paper of a general or rambling character might prove the more interesting.

Until some seven years ago, when I was appointed to the Chair of Veterinary Science in the Louisiana State University and American Medical College, with my domicile in the city of Baton Rouge, the capital of the State, such a personage as a graduated "horse doctor" may have been read about, but by the majority of the inhabitants had never been seen, and for some time I was, in the eyes of those good people, a living, walking curiosity, presumed, no doubt, to be endowed with the supernatural ability to cure all the ills that animal flesh is heir to. In time, however, the novelty died out, and it was found that the qualified veterinarian, in human form, had none of the mysterious about his "make-up," but that he was simply an exponent of a noble branch of medical science, with a knowledge—from his training—superior to that possessed by the empiric, to

whose tender mercies(?) and lack of knowledge had previously been intrusted the medical(?) care of their live-stock.

This experience has reference principally to the country districts in Louisiana outside the city of New Orleans, which city graduates have been located for some years.

Veterinary medicine and surgery, in the more Southern States, are still in their infancy; but through the influence exerted by the reputable graduate the people are beginning to realize the value of intelligent aid in the care and treatment of their animals, in contradistinction to the illiteracy and superstition of the empiric, who is usually in the habit of compounding his mysterious nostrums at certain phases of the moon and performing his so-called operations under similar lunar conditions.

The "quack" is still very largely in evidence, not only the native, but frequently we have men from further North, of the "flying specialist" type, who rarely make their appearance twice at the same place, but who usually make good use of their time and wits on their first visit, and succeeed in taking the proverbial "barrels" of money out of the pockets of the credulous and confiding stock-owner.

Unfortunately, we have as yet no State law to protect either the public or the profession against this class of imposition. In fact, I think the present existing conditions would hardly warrant legislation on this subject for some time yet. Outside of New Orleans there are few cities of any great size; stock generally, although improving very much of late, is not of a very high class, and in many cases the owners prefer to let them take their chances rather than send any distance for the services of a qualified veterinarian. This condition of affairs, however, is gradually changing as the value of our services becomes better known; but when I tell you that the State of Louisiana, outside of the city of New Orleans, can boast of only three or four qualified men, you can readily see why it is that any sort of individual who makes the merest pretence to a knowledge of the diseases of animals is pressed into service.

There is one section of the State, however, in which the live-stock is of considerable value, and that is on the sugar plantations, some single plantations owning mules to the value of $20,000 or more; and of course the maintenance of health among these animals, from an economic standpoint, is a matter of very great importance.

Mules have been cheaper of late, but not so long ago sugar mules

averaged from $175 to $250 per head, which will give you some idea as to the class of animals. The sugar belt being easily accessible from New Orleans, a good deal of the practice is done by veterinarians resident in that city. I have had a good deal of experience myself with the sugar-plantation stock and its management, or perhaps I ought to say mismanagement, and to give a little of that experience might be of interest to the meeting.

I might state here that it is estimated that something like $100,000 is paid annually for sugar mules to replace those that die from disease and injury. This represents an enormous amount of loss, and it is evident there must be some substantial reason for it. Dietetic diseases are responsible for the largest percentage of the mortality, and gaseous or flatulent colic about heads the list. This is largely due to an almost entire want of knowledge of the anatomy of the digestive system and the physiology and chemistry of food and feeding. When first making investigations as to the predisposing and exciting causes of so many fatal cases of colic, enteritis, etc., I found an absolute lack of anything approaching a proper system of feeding. It was common on some plantations to feed the mules—during hard work—only once per day, and that at night, the manger consisting of a long, wooden trough and the mules all loose; the consequence being that, having to undergo such a long interval of fasting, the animals were so voracious that before their hunger could become appeased they had "bolted" a considerable quantity of grain, not at all or only imperfectly masticated, resulting in fermentation, from want of proper mixture with the various digestive fluids and the generation of gas; then, on account of being loose, the mean, pugnacious animals got more than their share and deprived the more docile of a sufficiency, besides inflicting injuries by kicking.

It is customary even now among a great many to feed twice per diem (at noon and at night), the last feed being sufficient in quantity for two or perhaps more ordinary feeds, to which the animals stand up until they feel themselves satisfied, which is well into the hours at which they should be lying down, resting their worn-out muscular systems.

The principal excuse generally offered for such a system is that of custom; and there is no doubt that the continuance of such absurd methods is largely due to the fact that the responsibility for the health and condition of the sugar-plantation animals is left almost entirely in the hands of illiterate and often superstitious individuals as hos-

tlers, who receive mere nominal wages, which is the height of false economy and is extremely inconsistent when we consider that for all the other departments, such as in the field and in the sugar-house, experts are engaged at good salaries.

Another cause of injury and many deaths among sugar mules is pressure over the loins from plough back-bands, producing paraplegia. The negro ploughman, if not closely watched, will shorten his back-band; place it, in some cases, close up to the external angles of the ilia, and then hitch his traces up to it, causing the greater part of the work of lifting and traction of the plough to be imposed upon the lumbar region, where there is least support to the back. His object here is, when shallow ploughing is required, to make the mule do the work he ought to do in elevating the point of a plough that really ought to be at the blacksmith's shop to be put in proper running order. Another reason attributed to this style of gearing is that when a slow-gaited negro gets a fast-gaited mule he resorts to this method with the object of causing uneasiness to the animal and a consequent slowing of his speed.

On account of the want of information with regard to dietetics on the part of many of the owners, a great many of whom are city men, and the greater part of the responsibility of the care of the live-stock being placed in the hands of the illiterate hostler, we have frequent instances of disease and death from inferior quality of food as well as overabundant quantity. I can recall one in which sixteen mules were affected in the kidneys in various stages of disease, from insipid diabetes to suppurative nephritis. Before my arrival on the plantation five of the animals had died, the last one of which offered the opportunity for an autopsy. Each kidney weighed about six pounds, and on section revealed in the cortical portion numerous purulent abscesses. After making a number of inquiries regarding the food, I found that for two months previous the animals had been fed peavine hay which was almost in a state of nitrification. I subjected a sample to the action of sugar solution, resulting in the production of butyric fermentation, which you all know is putrefactive fermentation.

It might be interesting to notice here that the danger of this hay, which is extensively fed with us, is that if improperly harvested and cured or subjected to moisture as from a leaky barn-roof, fermentation may easily develop potassium nitrate. The plant is the "cow pea" (*dolichos sinensis*), and nitrogen predominates in the peas and the leaves, while potash is most abundant in the stems. In harvest-

ing the hay, if the leaves are not saved the loss greatly depreciates its value as a food and increases the stems, with a superabundance of potash and a deficiency of nitrogen, and this excessive amount of potash in the stem of the vines also suggests most careful pains in curing, so as to prevent the development of this salt, which, when continuously fed for a length of time, produces excessive diuresis, resulting in more advanced kidney derangement.

It is not to be wondered at that such conditions as I have just alluded to did and still exist when we take into account the length of time the stock-owning public, and more especially in the agricultural districts, were in the hands and at the tender mercy of empiricism, with few if any in those sections competent to lend intelligent aid. Changes are now, I am glad to say, gradually coming about for the better. The spirit of inquiry is taking hold of our more progressive stock-owners. Information is anxiously sought after with regard to the nutritive value of the various food-stuffs, nutritive rations, properly balanced rations, etc. On many plantations the feeding—during hard-working seasons—of the best and heaviest oats that can be procured, in which the necessary nutritive principles exist in the best balanced condition, is supplanting the system of exclusive corn feeding, with its excessive heat and fat-producing properties in proportion to its albuminoid or muscle-forming elements. The purest obtainable water-supply is being procured either from deep wells or through pumps from the vast waters of the Mississippi River instead of from shallow wells, generally situated at the lowest portion of the stable lot, and being contaminated by seepage from the surface. The systematic feeding and watering of stock is becoming to be looked upon as a necessity for the maintenance of health and the prevention of disease. And so, where ignorance and carelessness once largely predominated, intelligence in a great measure now prevails.

Although no State in the Union, I suppose, could produce relatively such an abundance of luxuriant native and other grasses as Louisiana, it seems paradoxical to state that we have to depend largely on the West for our hay-supply, some of which is of such an inferior quality that I am convinced it would not be bought for food in any other market in the country except the South. Of course, as education in the science of feeding progresses with us, other markets than the South will have to be found for inferior articles of stock-food.

From such causes we frequently get diseases of a mycotic nature.

A few months ago I was called to investigate the cause of a disease among a levee contractor's mules that were at work repairing the levee or banks of a section of the Mississippi River. I found thirty-eight of the animals in hospitals suffering from parasitic stomatitis, with extensive ulceration and denudation of the mucous membrane of the under surface of the tongue and of the buccal cavity. Sores had been produced in the angles of the lips by the bits, which no doubt favored access of the fungus. The food—both oats and hay—which was being used and which was of a very inferior quality, was replaced by a superior grade, and in a short time, with the assistance of a little medication, the animals made a gradual and satisfactory recovery.

Among the contagious diseases with which we have to deal, glanders and anthrax are perhaps the two most important. We now have a State law for the control and eradication of contagious diseases, which was passed by the Legislature during the session of 1895, but it lacks completeness.

Previous to the passage of the act we had a great many outbreaks of glanders, chiefly imported from other States by unscrupulous horse and mule dealers, who took advantage of our lack of legislation on the subject as well as of insufficient knowledge on the part of the prospective purchaser. Control and extermination of outbreaks of the disease have usually resulted very successfully in the various parishes by the local authorities or police juries, as they are called, as soon as the disease was identified by some one competent to give an opinion, and all suggestions given with regard to the best sanitary measures to be adopted have always been strictly adhered to and carried out with very satisfactory results.

But although the disease has been combated very successfully after its appearance in the State, we would require an organized inspection staff, with inspectors stationed at various points, to prevent the importation of diseased stock over the State line. Such an organization would, of course, require a considerable appropriation, and as yet our people are not sufficiently alive to the necessity for such an expenditure.

Osteoporosis seems quite prevalent in the South. I have come across a number of cases, but personally I have not been able to do anything with the disease from a therapeutic standpoint. There is a wide field for our Experiment Station veterinarians in the investigation of this malady, as it militates very much against successful high-class horse breeding in the South.

We have annually a large mortality among our hogs, and unfortunately the term hog-cholera with us is so comprehensive that it covers all the diseases the porcine tribe is heir to. Although the hog industry in our State is assuming considerable proportions, and the herds of pure-bred animals are becoming quite numerous, the majority of the hogs are range animals—principally "razor-backs"—and their food consists of what they can get to eat in the woods. Large numbers of them die annually, mostly from gastro-intestinal troubles. There is perhaps less attention paid to the hog with us, from a hygienic point of view, than to any other of the domestic animals, and as the result of in-breeding and general unsanitary conditions and surroundings the annual death-rate is large.

During the months of May and June last the northern parishes of Louisiana experienced one of the most extensive and virulent, and, from a professional standpoint, interesting epizootics of anthrax that has occurred for many years. But before proceeding with the description I might state that sporadic outbreaks in the Mississippi bottoms are not at all uncommon. Last summer I was called to a large sugar plantation where three mules had died so suddenly that the owner had suspected foul play, but on seeing the cadavers I was suspicious of anthrax. An autopsy on one of them revealed pathognomonic post-mortem symptoms of the disease, which a subsequent microscopical examination verified, by the identification of the bacillus anthracis in the blood. The mules were being fed crushed corn and rice bran—the former a product of the plantation; the latter an imported article. I suspected the bran as a probable vehicle for the spores, as the rice might have been raised on a place that had previously been infected. I advised the discontinuance of the bran, for the reason just stated, and no more deaths occurred; but a fortnight afterward the bran was again inadvertently resorted to, with three or four more deaths resulting. After this the bran was entirely discarded, and no more fatalities from the disease have since occurred. Of course, the necessary sanitary precautions were adopted to check its ravages.

In the large cotton-growing sections in the northern portion of the State they have, generally in the spring, a condition in their mules which they consider anthrax or charbon, as it is termed by our French population. It consists of an enlargement, often extending from the inguinal region to the xiphoid cartilage of the sternum, and in some cases to the carniform cartilage, but with no apparent constitutional disturbance whatever. Their treatment is

extremely heroic, or, perhaps a better term would be, barbarous. Hot shovels, concentrated lye, the part saturated with turpentine and then set fire to, are examples, and if the poor animals survive this they usually recover, but with an eschar that they carry with them until death.

The condition is really one of anasarca, the result of indigestion. As soon as the animals have finished the work of cultivation they are turned into the cotton-fields—after the cotton has been picked—to gather their living in the rows, in which there is a considerable quantity of grass, and for two or three months in many cases they receive no grain food whatever. When the time arrives in the spring for the ground to be broken the mules are brought up and without the slightest preparation are given full, hard-working grain rations.

During the prolonged interval between grain-feeding the system has become so inured to the light, easily digestible alimentation—which toward the last is somewhat scant—that it is generally more or less in a state of atony. The sudden change when in this condition to a more highly stimulating nitro-carbonaceous grain ration, requiring greater powers of digestion, produces indigestion, and from overstimulation we have transudation of serum from the walls of the atonic bloodvessels, gravitating into the subcutaneous tissues on the lower portion of the abdomen.

As I have said, many believed this to be charbon, simply on account of the swellings; and if the animal—which really would in most cases recover without any medical help—survived the treatment, they were firmly of the opinion that they had succeeded in curing the disease. Such is an example of the state of our knowledge regarding some varieties of disease and its treatment.

The genuine outbreak, however, which I previously mentioned and wish now to describe, has perhaps done more to bring into prominence the regular graduate and the veterinary profession in our section of the country and to upset the calculations of the illiterate "charbon doctor," with his vaunted "sure-shot" charbon nostrums and reduce him to his proper place in the eyes of the intelligent class of people than anything that has happened within the last decade. It has been said that it takes a calamity to wake our people up, and the recent epizootic could be viewed as little short of that. The first indication I had of this outbreak was a dispatch from the general manager of a large cotton-planting syndicate, owning something like thirteen plantations, with four to six hundred head of

mules. On one of the outlying properties, which was first affected, the disease was in a most virulent form, and the ultimate loss on this place was nearly if not altogether 100 per cent.

Probably the most interesting point is that the outbreak was of cutaneous or carbuncular form, with flies as the transmissive agents. The disease spread with such rapidity that it was in a very short space of time to be found doing its deadly work in some eight or ten parishes. The people were almost panic-stricken, and in their helpless condition, for want of intelligent information and from being largely in the hands of the "charbon doctors," who expected to reap a rich harvest, their efforts were directed solely to the treatment of individual cases, without the slightest idea of trying to stay the ravages of the disease by any attempt at any modern system of sanitary science. Charbonous carcasses were simply hauled out to the woods, where range animals were grazing, infecting the surrounding country, besides presenting laboratories where flies of various specimens could obtain fresh virus for distribution. This dangerous procedure was adopted in the early part of the outbreak, with the result that animals of all kinds became affected, either from grazing over the infected pastures or devouring the flesh of the charbonous carcasses. It was reported that the deer in the swamps were succumbing to the disease, and several authentic cases of the disease in human beings were recorded, some proving fatal.

The disease having extended to range animals, which were altogether beyond control, the more domesticated stock, as the work animals, cows, etc., only could be dealt with as regards treatment.

Realizing at once the gravity of the situation and the likelihood of an extensive spread of the disease, I at once suggested protective inoculation with the Pasteur anthrax vaccine, to try to protect the work animals, so that the farming operations would be delayed as little as possible. Fish-oil emulsion was sprayed daily over the animals to prevent the attacks of flies, which were in alarming numbers, and the police juries of the various parishes passed a sanitary ordinance compelling the cremation of all charbonous and other carcasses.

The therapeutic treatment followed was that suggested by Duvaine of an iodine and potassium iodide solution internally. Broken doses of mercurous chloride combined with a saline were also administered. The external enlargements—as early as possible—were injected at various points, by means of an ordinary hypodermic syringe, with a 5 per cent. aqueous solution of carbolic acid, with two grains of

bichloride of mercury to the ounce of the solution. This treatment, which was to destroy infection in the local area and arrest absorption, had been suggested by Arnoldow in malignant pustule in the human being. Unfortunately it was impossible to procure sufficient of the protective lymph at the outset to inoculate such a large number of animals, as the entire supply in the stock of the Pasteur laboratory in this country became exhausted, and Europe had to be drawn upon to complete the orders. Gradually the flies seemed to disappear or change their location; the disease became very much less virulent, and whereas in the beginning it claimed from 75 to 100 per cent. as its victims, toward the last 75 to 100 per cent. seemed to recover, even without vaccination.

In some of the infected districts visited I witnessed a most interesting and I should think most unusual spectacle, but whether or not it was the result of anthrax would require to be decided by experiment. In some fresh-water lakes, into which charbonous carcasses had been thrown, large quantities of fish could be seen floating on the surface of the water, dead. It has generally been considered that fish, owing to their lower temperature, were refractory to the disease. But here we had a temperature at the time of 90° F. or over, with the temperature of the water relatively high, which may have been sufficient to bring about changed conditions of vitality, and if the fish were at all poikilothermic, may it not have been possible and even probable that they became infected and died of intestinal anthrax? This is a very nice as well as a very important point, which is worthy of further investigation, because, if such is the case, fish, under such conditions, may become a very important factor in the spread of anthrax, not only to the lower animals, but to man himself.

The section of country over which this outbreak spread is flat, thickly wooded, subject to inundation, and very swampy.

Although flies of all kinds are always very numerous in summer, one of the species of "tabanus, the 'tabanus lineola,'" was more so this year than had been noticed any year within the recollection of some of the oldest inhabitants. In fact, they were to be seen in the dwelling-houses in greater numbers than even the "musca domestica" at the height of summer; and during the time of their greatest numbers animals were positively covered with them, and blood could be seen trickling down wherever the mouth-parts of the fly had been withdrawn.

The fly here being the transmissive and the most important agent

in the spread of anthrax, the thorough study of its life-history should engage the serious attention of the student of economic entomology. So far, I understand, the study of this species has not been satisfactorily prosecuted, on account of the difficulty of obtaining the ova and breeding the flies artificially, although it does seem to be known that the larva lives in damp earth and in water and that the adult is abundant in the neighborhood of swamps.

Many points of interest crop up as to the various ways, besides inoculation, it is probable for the fly to propagate the disease. I do not think it is a settled point whether or not the disease kills the fly. It is probable that the excreta of the fly may contain bacilli which afterward sporulate on the grass or herbage which is eaten by stock, etc. These and other points are worthy of elucidation for the protection and benefit of stock-owners, at all events, along the region of the Mississippi Valley; and if some means could be discovered for the destruction of the ova or larvæ of this and some other species of bloodsucking flies, it would be a tremendous boon to the inhabitants of my part of the world.

This has been one of if not the most extensive outbreaks of anthrax on record, so far as I am aware, brought about by the external or cutaneous mode of infection.

I feel, gentlemen, that I have occupied a great deal too much of your valuable time with a paper which contains so little of a scientific nature, but, if I have by chance touched upon any subject which may be of interest or perhaps benefit to any of you, I will feel fully compensated for any little time or trouble I have taken in its preparation.

DISCUSSION.

Dr. Rayen: The description he gives of feeding animals in Louisiana prevails to a great extent also in Tennessee. Of course, among some of the finer breeding establishments they have made great progress and have adopted modern ideas in regard to those subjects; but the work stock on the plantations is treated in Tennessee about as described by the essayist in Louisiana. The barbarous treatment described is also prevalent in Tennessee in the numerous diseases affecting animals, and quackery is practised there by *flying doctors* who are sent there from the North, and in some instances they take large sums of money from the rural districts.

Dr. Clement: The subject of anthrax is one of great importance, to my mind. It has caused me more worry than any of the other diseases since my appointment as State Veterinarian. We have had there two outbreaks of anthrax near the Delaware line. In the first the owner lost several cows and, I think, one or two horses. The animals were apparently well in the evening and dead in the morning; that is, they did not die all at once, but as each individual animal was attacked death followed between evening and morning, as a rule. The clinical symptoms were those of anthrax. The post-mortems were held and the biological analysis was completely made at the Delaware Experimental Station, at the instigation of Dr. Mackie, and therefore it was proved beyond possibility of a doubt that it was anthrax. There was no history of the pastures or farms of the neighborhood obtained. This man had not bought any cattle lately. There had been no new introduction of stock upon his farm. Therefore the question was, "How could he possibly have gotten the disease on his place?" We found upon investigation that he had recently bought some glass fruit-jars. We found upon further investigation that the man from whom he bought these jars must have bought them from Pittsburg or from some place thereabouts, or in New Jersey, where anthrax is very prevalent. These jars were packed in marsh grass, as we found upon further investigation, and we found that this was cut from pastures in New Jersey where anthrax had been prevalent for some time. He had fed some animals upon this grass, and they died from anthrax. Now, the important part to my mind is the fact that the Department of Agriculture has apparently no power to stop the dissemination of this marsh-grass infection throughout the country by the packing of these fruit-jars. We have had other outbreaks of disease in the State, which from their history may possibly be anthrax. A man lost two horses near Baltimore. It was found that he had bought some groceries by the barrel. We found that there was marsh grass in it; that he had gotten that from a dealer in glassware, and that the dealer bought this from the infected area of New Jersey. It seems to me that that is a rather important matter. We certainly do not want to get our State infected with anthrax. We do not want to have to go the Legislature and ask for an appropriation of money to stop it. We do think that something should be done so that the restriction of this method of disseminating the disease, quite probably disseminating itself by marsh-grass packing, should be stopped.

Dr. Rayen: During the season of 1895 we had an outbreak of anthrax at McKenzie, Tennessee, about ninety miles northeast of Memphis. The outbreak occurred among the town cows and was confined almost exclusively to the corporate limits. There was located in the town a pond that had been made by an embankment of the railroad, that had in some way become infected, and we never could trace the origin of it. We do not know how it came to that inland section, so far away from any other outbreaks, but altogether there were at least sixty animals of all descriptions that died from the disease.

Dr. Clement: Three years ago the disease broke out in Delaware, an infection from New Jersey by the shipping of marsh grass. On this farm where the outbreak first occurred, before there was any State supervision at all, the animals which died were buried some five or six feet under ground. As soon as the importance of the matter was discovered this pasture was put in quarantine. There had been no animals upon that pasture for three years until about three months ago. The animals that were put upon that pasture two or three months ago were to all appearances healthy. They had been there but a few weeks before a large number of them died of anthrax. That shows how tenacious of life the organism is, and how great the importance is that there should be something done in this matter.

I would state another instance here. The cows that died upon this farm in Maryland, the first one that died, the owner, not knowing what the trouble was, gave a part of the carcass to a neighhor who kept fox-hounds. The meat was taken to his orchard and hung up in a tree. The hounds were given the meat to eat, and one of them died under circumstances which point to anthrax; the other had a carbuncle, and finally recovered. The ground around this tree was fenced off; some sheep were bought and put upon the farm, and one of them died.

Dr. Grange: Since such an eminent authority as Dr. Swandrick has intimated that anthrax does not prevail in this country, I think it is well for us to know that any information to the contrary shall be made.

It happened last winter that I had the privilege of visiting the bacteriological laboratory of the city of Toronto, and there I made the acquaintance of the provincial bacteriologist. I had been informed that anthrax did not prevail in the Northern States and the province of Ontario. I was informed by this gentleman that at

the town of Acton, a small place about forty miles west of Toronto, they had an outbreak among their cattle which caused the death of them very suddenly. The disease caused people to inquire of the authorities of Toronto as to the cause of it. The bacteriologist was sent out to investigate, and after examining some of the blood of the cattle he determined that it was anthrax, but for some time he was at a loss to know where it came from. On inquiry, however, he found that above the flats, where this outbreak occurred, was situated a tannery where they tanned all kinds of hides. On visiting the owner of this tannery he learned from him that the price of hides had become so high in the province that he sought elsewhere for them and that he had imported a lot from South America, and they were tanned there. It was noticed shortly after that these cattle were infected with the disease. The pasture-lands were low and were inundated, after which these cattle were placed upon the bottoms, and they soon began to die with the complaint, which turned out to be anthrax. If this is true, it illustrates what Dr. Clement said in regard to the life of this disease, it having gone through the tanning process; and I think this is a matter which should be looked into thoroughly, and some remedy applied if possible for its restriction.

Dr. Cary: I have listened to the paper of Dr. Dalrymple illustrating the work in the South, and I wish to say this in regard to anthrax: We have limited outbreaks nearly every spring and summer, but have not used the Pasteur vaccine at all. I would like to ask whether Dr. Clement or the people of New Jersey or Delaware use it.

Dr. Clement: We have had all the remaining animals upon this farm vaccinated and all the animals upon the neighbor's farm, but the fact remains that his stable is affected. We have proven that by putting healthy sheep in where the diseased animals have been, they died. Now, we have protected the rest of this man's animals by vaccinating them, but we cannot protect him from any he buys in the future. And when his neighbors visit him they must know that they will not be allowed to put their horses in his stable to feed. We have vaccinated all of his cattle, horses, and mules, and, contrary to the reports that we had heard before, we had no trouble with the horses and mules, and no trouble of any kind.

Dr. Hawkins: I understand they have had a slight outbreak in the town of Guelph, in Ontario. As Dr. Grange will no doubt

remember, there has been more or less anthrax in that vicinity for a number of years back. I remember when I first commenced to practise of hearing of anthrax at that time. I understand that this spring some time—in the month of May, I think—they had some few cases, and there was one of our members of the profession called to treat one or two of them, and unfortunately for him he met with his death through one of these cases. He was very fond of fishing, and had been out trout fishing shortly before, and had run the point of the hook in his finger. A few days after he made the post-mortem on one of those animals that had died; he contracted anthrax and died, I think, within three days from infection.

Dr. Miller: My practice lies far North, being from Vermont, and we have anthrax there in most every section to some extent. A year ago the past autumn we had an outbreak of anthrax within the limits of the city (Burlington), and we used Pasteur's vaccine. We had in a herd of over 100 an outbreak of such severity that there were thirteen deaths within eight days. Most of these were in good health at night, but found dead in the morning. We made the vaccinations with the result that after the first we lost one animal, a two-year-old. After that there was no loss on the place. After the first three died they were skinned in the yards; the skins were hauled around the yard, and when we spoke about cleaning up the place the man said this animal was killed here, another was bled there, and another was skinned there, and the skins are gone, and the barn stands there now. I think the vaccine in that case did all that could be expected of it. We had another outbreak, and had the same results with the Pasteur vaccine that we had in Burlington. In such cases the buildings are infected and will spread the disease to animals brought in contact with them.

The bottom lands around Burlington are overflown every spring and fall, and just above there are several factories—two woollen mills and some others—and it is the impression that it comes from there. We find cases from twenty-five years back that I can trace, and we have in some instances a case where a man lost his life.

Dr. Thompson: We have a few outbreaks of anthrax in our country and at places very far apart, and sometimes in uninhabited regions, where large herds of cattle have run for the first time. You were speaking of the length of time this germ may remain in the ground. We believe these outbreaks were caused by the buffalo roaming over those plains not very many years ago.

The old hunters there tell us that at certain times of the year a disease would break out and a great many buffaloes would die, and as far as they could give the symptoms they resembled anthrax; and sometimes when they found an animal that had just died they would skin it. Then at times men would die—their hands and arms would swell, and the disease would advance, and the hunters would come to their death in that way. We have had a few outbreaks of anthrax among our domestic cattle. We find that in a large herd—three or four hundred cattle in the herd—I do not remember where there have been more than nine animals died; in the smaller herds perhaps not over three or four. We have had the blood examined and found that it was anthrax; but the disease seems to stop right there, and in many cases for a number of years we have not had a recurrence, but we invariably had the animal burned and destroyed. If we can find that any animals have died in that way we have the owner burn them.

Dr. Miller: Dr. Clement mentions the death of a dog with symptoms of anthrax after eating anthracoid flesh. It is generally supposed by English authorities that dogs are immune. I would like to know whether dogs are susceptible.

Dr. Bishop: There has been anthrax in my section, and there have been as high as seventeen and eighteen head died, and the flesh has been fed to dogs; the dogs have not died. Others have been bled in the mouth and fed it, and they have died.

Dr. Dalrymple: Dogs have died in this (Louisiana) outbreak, and chickens also. They had been fed from the meat of those animals.

Dr. Rayen: In Tennessee, in 1895, dogs died to some extent in the same outbreak; they had eaten of the carcasses of the animals that died of anthrax.

Dr. C. P. Lyman: A number of years ago Professor Axe reported an outbreak of this sort which he met with in England, during which outbreak the dogs which had eaten the meat of the dead animals became diseased themselves and died from it.

Dr. Thompson: If we are not very careful in our country the Indians will eat these animals that die. They do not care what the cause of death was, whether they died a natural death or from some other cause. I think the Indians are immune to all kinds of disease.

Dr. Dalrymple: I should like to say that in the summer of two years ago the department of agriculture of the State of Georgia asked me to make an investigation regarding the nature of an out-

break of disease. On examination I found it was anthrax. We tried some experiments, giving some animals properly cooked food. All those animals affected were fed on this food without cooking. Some other cows in the city that were fed this food died from it, and even those on the place that were fed this food uncooked, showing conclusively that the food was the vehicle. About 250 animals —mules and horses—were treated with vaccine, and after the first inoculation not more than 3 per cent. were affected with the disease, and not 50 per cent. of that number died. After the second inoculation a few cases occurred, with no deaths, while the non-vaccinated animals were dying all around on the farms.

SERUM-THERAPY IN HOG-CHOLERA.

By A. T. PETERS, V.S.

Mr. President and Fellow-members of the Association: The subject which I have chosen for a paper is one which is of great interest to the Western States as well as to the Eastern ones; at least those Eastern ones which raise a great many hogs. On account of the great loss every year, the Nebraska Experiment Station has taken up and is compelled to investigate hog-cholera.

Serum-therapy, as we all know, has been used in various diseases, such as tuberculosis, rabies, and pneumonia, though obtained with some difficulty from immune rabbits; consequently this treatment has not been used to a great extent, but the subject is promising enough to observe further investigation. It has also been used in enteric fever. Good results have not been obtained in practice, though laboratory results have been very promising.

In typhoid fever it was used by Dr. Legrain during an epidemic in Algiers with good results. Cholera in man is different from that in animals, but still Dr. Behring announces that he has a curative serum.

Syphilis has also been treated by this method, and it is claimed in some of the literature by various authors that good results were obtained.

The streptococcus infection. The serum from animals made immune by vaccination has been employed with good effect in erysipelas and puerperal fever.

In cancer no satisfactory results have been obtained thus far.

Tetanus. This affection is very hard to cure in animals, and no conclusive results have been obtained in man. The serum acts as a prophylactic agent against tetanus.

In diphtheria the serum treatment has scored its most remarkable triumph. The few accidents which have occurred may be overlooked when we consider the wonderful success that has been attained.

Serum has also proven successful in snake-bites.

From the foregoing remarks it can readily be seen that serum-therapy has a brilliant future before it. Dr. Lorenz, of Darmstadt, Germany, has successfully made rabbits immune against swine erysipelas. In his article in the *Deutsche Zeitschrift für Thiermedicin*, Band xx., he gives his results, which are very satisfactory. It will be noticed in his article that he has protected pigs against swine erysipelas by subcutaneous injections of blood-serum from animals previously rendered immune against this disease. In the first experiments he obtained the blood-serum from previously protected guinea-pigs and rabbits; but it will very readily be seen that these animals were too small and did not yield enough blood to make it practical, and therefore he purchased pigs nearly ready to slaughter, and these he inoculated with protective material previously obtained from the blood of rabbits. In nearly all cases the animals exhibited no reaction and continued to thrive under the treatment. When they became protected he killed the animals, and their blood-serum was used to protect other pigs. The blood-serum used was injected subcutaneously behind the ear or between the thighs. It is asserted that this method has already been used on a large scale, which is shown by the table which accompanies Dr. Lorenz's article, and that it is devoid of danger and is successful in conferring protection. Dr. Lorenz used blood-serum diluted with distilled water—that is, a pig weighing about 150 pounds would receive about 5 grammes of blood-serum diluted with 5 grammes of sterilized water, this being one dose.

Having illustrated what has been accomplished in the serum-therapy, I will now give a preliminary report of what has been done at the Experiment Station of Nebraska during the last year.

Requests were made from numerous parts of the State urging the Chancellor and the Board of Regents to have investigations made in swine diseases. Appropriations for such investigations were accordingly made, and with the consent of the Chancellor and Board of Regents I commenced work to see what could be done with blood-serum from animals made immune against hog-cholera.

Knowing from the experiments of Dr. Lorenz that the smaller animals yielded but very little blood, and that it was not practical to use them, we therefore chose a larger animal—and selected the horse. Four horses were purchased, all of which had undergone the mallein-test for glanders. After it was ascertained that these animals were healthy, they were given 5 c.c. of a virulent culture of hog-cholera. (I will say here that at the seat of inoculation the neces-

sary antiseptic precautions were used, such as shaving away the hair, and thoroughly disinfecting the surface with corrosive sublimate.) The syringe and all instruments used had previously been sterilized. The temperature of the animal was taken every two hours after the injection of the virulent culture, and fever charts kept of the same. The first 5 c.c. made the animal very dumpish in a very few hours, and the temperature would invariably rise from two to three degrees after the injection. They would not be entirely off their feed after the injection, but showed decided symptoms of not relishing the first feed. These symptoms lasted but a few hours, when signs of recuperation were noticeable. No antiseptics were used with the first injections, such as are prescribed with the Behring method for diphtheria, but all the succeeding cultures were injected with a few drops of carbolic acid. This was done to arrest suppuration and to avoid the large abscesses that formed within two days after the injection of the culture. The next injection was made five days later, and consisted of another 5 c.c. of a virulent culture. Again in five days another but larger dose was administered—10 c.c. We increased the dose 5 c.c. at a time, every week, until the animal was immune. The largest dose any of the animals received was 200 c.c. Two animals showed alarming symptoms after the first dose of 200 c.c., but soon rallied. After the animals ceased to react to the cultures they were bled and a small quantity of blood taken from them and tested on rabbits. This was done the same as is done in the method for testing diphtheria-serum. When it was found that the animal was sufficiently immune a larger quantity of blood was taken from the vein and put into the ice-chest to stand for forty-eight hours. The serum was then siphoned off into a large bottle, from which it was run through a filter—the filter described in the *Johns Hopkins Hospital Bulletin*, No. 51, which contains an article describing a quick method of filtering blood-serum. The bottle that receives the filtered serum contains a rather large piece of camphor, which, with the bottle, is previously sterilized. This bottle with the contents is then set away in a cool, dark place, and can be used at any time. The experiments at the laboratory have shown that it takes from 8 to 10 c.c. of undiluted serum to make a hog of about 150 pounds immune. We have never had any mishaps in the inoculations made in the various herds throughout the State. The herds which have not proven to be perfectly immune—as you will notice later—were those on which we tested the dose, not knowing positively the amount of serum necessary to make a large pig immune.

The question is, Which gives the power of immunity? Most of the literature of to-day seems to give credit to the leucocytes for their germicidal power, and others seem to credit it to a toxin in the blood. We are enlightened more and more every day with numerous experiments, but the experiments that have been conducted in the serum up to date, and mostly that of diphtheria serum (antitoxin) unquestionably show that it is the white blood-corpuscles which digest the bacteria. The main facts connected with immunity have been known from time immemorial. The horse does not contract the bovine diseases called contagious pleuro-pneumonia. The ox has a like freedom from glanders. They are examples of what is termed inherited or natural immunity. Before endeavoring to discover what happens when the germs of an infectious disease find their way into the body of an animal that has acquired immunity by a previous attack, it is well to have clear notions regarding the way in which the germs of infectious disease produce their deleterious effects. The pathogenic bacteria are vegetable parasites, and like many of the more highly organized members of the same kingdom, they elaborate substances that are poisonous to the animal body. As a familiar instance, Cadeac cites the experiment of putting yeast in a solution of sugar, which mixture will produce carbonic acid and alcohol. After a certain time the fermentation will stop. If we add sugar to the liquid, yeast will recommence growing, but the fermentation will soon again stop, and will not begin afresh even if we add more sugar. If, on the contrary, we add water, the fermentation will commence again, and will also do so if by heating the liquid we drive off the alcohol which has been formed. In the first case the effect of the water was not to add to the materials necessary for the nutrition of the ferment, but to dilute the matters formed by the yeast, of which alcohol was the principal. In the second, the heat expelled the alcohol or considerably diminished it, and the fermentation commenced anew. Here the alcohol has a poisonous or a paralyzing effect on the yeast which produced it. The theory may explain the fact that certain diseases, like contagious pleuro-pneumonia and pink-eye, run a definite course, at the end of which, if the animal has survived the severity of the symptoms, the disease will disappear. In this class of diseases the acquired immunity will naturally be comparatively short-lived. In affording an explanation for the action of the system in resisting the attack of diseased germs, pathologists as a rule take one of two sides, namely, that of those who hold the theory that

protection is obtained by serum of the blood; or that of those who, with Metschnikoff, award the credit to the leucocytes and cells of the part. Perhaps the safer plan would be to regard both theories as partly correct. Newtall and Buschner and others have shown that serum of the blood without the presence of leucocytes has a well-marked germicidal action, which, according to Funforder, is in accordance with the immunity of the particular animal. Now Funforder has shown that the germicidal power of the serum decreased with the temperature, and that it is strengthened by the addition of a drug which, like carbonate of potash or carbonate of soda, increases the alkali of the blood. We know that in inflammation the leucocytes and the cells of the injured part absorb and digest dead and effete matter. Now acquired immunity is never absolute. Thus, although one attack of smallpox or one of strangles almost always confers immunity from a second attack in respectively man or horse, exceptions are now and then met with. This immunity lasts a long time in some diseases; only a short period in others, and may have even a negative influence. In malarial fever, for instance, one attack increases the susceptibility to a second attack. In those diseases in which one attack has a well-marked power of conferring subsequent immunity, protection, according to Metschnikoff, is acquired by the previous training and devouring of microbes which the leucocytes have undergone. If we inoculate the virus of anthrax, for example, under the skin of an ordinary rabbit and of a rabbit which has been protected by vaccination, behold what we may observe at the respective seats of inoculation. In the ordinary rabbit the microbes multiply rapidly, the swollen part is full of watery fluid, and is poor in cells. Little by little the swelling extends, the neighboring ganglions enlarge, and the infection becomes generalized. In the protected rabbit, on the other hand, the bacilli multiply at first, but soon the leucocytes arrive in such great numbers that the microbes are taken and killed. The fluid in the swelling instead of being clear becomes thick. Cells are abundant in it, and the bacilli disappear. The disease does not extend and it becomes cured.

The experiments that have been conducted in the laboratory were to make pigs immune and to send them out to herds that were infected. This was done generally with the material that was sent in from a herd that made request for material. I will say that no material was granted to any herd before it was positively shown by cultures and by inoculations that the hog-cholera germ was present.

We tested the hogs at the laboratory, which experiment is still under way, with cultures and blood of animals that had succumbed to the disease. The animals would be tagged. One would be tagged "protected" and the other would be tagged "unprotected," and invariably within eight days the one that would not be protected would die, and on post-mortem the hog-cholera germ would be found. The dose generally received would be 1½ c.c. of the blood of an animal that had died, and that would be given to an unprotected animal. The same amount would be given to a protected animal with 10 c.c. of serum. Thus far at the laboratory we have not noticed any change in the animals, only we would notice on both animals an abscess forming at the seat of inoculation, which would heal up after ten or twelve days.

Experiments are now under way, feeding animals with dead material (viscera) of animals that succumbed to the disease. Thus far the unprotected animals contract the disease; and the others, that are tagged "protected" and run in the same pen with the unprotected animals, seem to fare well and show no symptoms of the disease.

Following is a statement of the various herds treated up to date:

The first antitoxin serum was used January 28, 1896, on Mr. S.'s herd of fourteen animals, two of which were sick. One of these succumbed.

The next herd treated was Mr. G.'s, on April 20th. This gentleman had ten sick ones and only one well one, and I may say eight of the ten that were sick were very sick—that is, they were very doubtful ones. Mr. G. lost five out of the ten sick, the well one not taking the disease at all.

On May 21st Mr. G. had suckling pigs inoculated, as he reported a loss of three head. He had lost no more after the inoculation. There were four head inoculated.

Mr. B. had sixty-three head inoculated on May 4th and 5th. Of the sixty-three head there were twenty-one sick ones, nine very sick, and four very doubtful of recovery. In that lot there were also fourteen piggy sows. Mr. B. reports a loss of only six—that is, the four doubtful ones died the following day, and two others.

The next herd was Mr. N.'s. Mr. N.'s herd was inoculated on May 18th. It consisted of eighteen head of pigs, seven of which were pronounced sick; two of these very sick. Mr. N. reports a loss of only two of the very sick ones.

Mr. W. reports his herd was inoculated on June 2d—103 head. Thirty-four of these were large hogs, seven of them with pigs, and

three of these had shown signs of disease. There were sixty-nine small ones; almost all of these sick at the time of treatment. There is so far no report of this herd.

Mr. O. L. S. had his herd treated on June 6th. It consisted of thirty-nine head: fourteen old ones, twenty-two suckling pigs, and three small shotes. At this writing we have no positive data as regards his experiment.

On July 25th Mr. C. had his herd inoculated—twenty-five pigs. These were in very poor condition at the time of treatment. They were so weak that the majority of them, say three-fourths, could not walk across the field. There is a report at this date of a loss of eleven of these animals.

On August 5th Mr. W. B. had seven head treated which were very doubtful cases, as they had not eaten anything for over a week. At this date there are three of those alive.

On August 5th Mr. D. H. had forty-two head treated. Fourteen of these were small pigs, twenty-four shotes, and four old sows; two tagged sick. At this writing we have a report of a loss of none.

Mr. John J. had his herd of fifty-seven head treated the same day. There were thirty-eight small pigs, seven old sows, and twelve shotes. Of these there were two of the small pigs sick, three large sows sick, and five small shotes sick. He has reported a loss of eight, but only of the ones that were tagged sick.

Mr. Z. S. B., on August 6th, had his herd of thirty-six head of shotes treated. He had two animals on his place that were sick for a week before treatment. At this writing there is no loss reported.

Mr. V. W. J. had his herd of twenty-three head treated as being a neighbor of an infected herd, and at this writing has reported no loss.

Messrs. J. & G. H. had their herd treated August 6th, of forty-three head, who at this date also report no loss.

August 9th Mr. I. P. had his herd of forty-six head treated, and reports that he has not lost any of the ones tagged treated, but reports losses of some that were left untreated.

August 11th O. M. E. had his herd of twenty-one head treated, on account of having his neighbors infected. At this writing reports a loss of none.

Mr. F. P. had one hog treated which was sick at the time of treatment, but does not report a loss at this writing.

Mr. J. E. M. was using a patent medicine for five weeks prior to his hogs taking the disease. He wanted eight animals treated on

which he had not used this patent medicine, and selected the sickest animals in the herd. They were tagged with our tag as being treated, and five of the eight at this writing have died; but there were thirty-five that were left untreated with patent medicine, and out of that number there are only eight alive.

Mr. A. E. P. had his herd treated, numbering twenty-eight, on account of his neighbor's hogs being infected, and reports at this date no loss.

Mr. M. K. had his herd of fifty-seven head treated. He reports a loss of eight, of which six animals were tagged sick.

Mr. M. S. had his herd of twenty-seven head treated on account of his neighbor's being infected, and at this writing reports no loss.

On August 20th Mr. C. A. Morrill, of Stromsburg, had twelve head in three different herds treated, all of which were very sick and doubtful of recovery. At present writing no report.

On August 22d Mr. C. H. Walker received 100 doses, which are also not accounted for.

DISCUSSION.

Dr. Salmon: I am sure we are all glad to listen to the paper of Dr. Peters and see that he has started out in this experiment in this branch, which is almost the last one to afford a harvest of thought in the way of securing information for curing sick animals of cholera or of granting immunity. There are some great difficulties to overcome in the management of hog-cholera in this way, and one of the principal ones is the fact that it is very difficult to distinguish between hog-cholera and swine plague, both of which are very common and both of which often affect an animal at the same time, so that the only way that I can see in which the two can be grappled with is to make the material, like the horses that are treated, immune of swine plague and hog-cholera, so that if the animal is affected by one or the other, or both, get the serum from the animal which we know has it, and then we might expect some good results.

Hog-cholera is difficult to manage for this reason, that the experiments that have been made in the past have shown that it is difficult to grant any immunity or any considerable degree of immunity by any sort of treatment; that is, it is a very easy matter to inoculate hogs with strong enough virus to produce immunity

but not in doses to kill, and you would suppose that if there is any such thing as giving immunity that that would be the best way to do it, and yet the experiments which have been made have shown beyond any reasonable contest that the inoculation of hogs as preventing this disease is a failure; that by any ordinary inoculation we cannot grant sufficient immunity to prevent the spread of the disease. There is only one way in which we have succeeded in this work by anything like immunity, and that was by vaccine inoculation, and in that way a degree of immunity would be produced which would grant a certain amount of protection.

As yet I believe that no one has been able to find anything that would make them immune so that it would last as long as the germs. A temporary immunity is produced with diphtheria and with other diseases by injections of serum, but not a very lasting one. The use of serum has rather been as a curative than a preventive, but still to a certain extent for prevention.

The comparatively small value of the animal, the short life of it, the expense of treatment, and the rather short period of time that the immunity produced by serum could be expected to last make it impracticable at the present time. If the disease breaks out in a district it generally keeps up for a considerable length of time, and very often starts in the spring or midsummer and lasts to midwinter—a considerable longer period than we could expect immunity to last in this way—so that to grant enough immunity to save the animal from the disease, the treatment and the time of the operator to give the injection, the cost of the serum, etc., are rather discouraging at first. But of course this is experimental work, and may be improved materially in that regard; and it is very fortunate that Dr. Peters has taken up the subject. He has shown that a serum can be produced with the horse that can be used to produce immunity to a certain degree, at least, and that there is a prospect of getting some practical results from it.

I may say, although it is rather premature, that we have been working in this line in Washington, and we have made some tests with horses, but not sufficiently to give much of an opinion upon it. But my idea was that the serum treatment would be more valuable as a treatment for sick hogs than to produce immunity; it may be that temporary immunity will be valuable, but we must all remember that it requires a great many experiments with this disease before we can reach any conclusion. You can treat hog-cholera with drugs of various kinds and get the most astonishing results.

You have herds where you can apparently cure almost all of the cases of the disease that occurred, and then you strike other herds where you give the same medicines and get practically no results from it; and that is the way also when you undertake to treat the disease by inoculation. Inoculation, as we all remember, was tried on a considerable scale in the western part of the country, and at one time it was thought that it was giving valuable results; but on a large scale it was not. I think we should give Dr. Peters all the encouragement we can, and test this on a large scale and see exactly what he can get out of it. The Bureau will continue its experiments in the same line, and I hope, by comparing the work, to be able to get it introduced in other stations and have them take up the work so we can get a sufficient number of experiments from which we can get some good results.

I will say that it is much easier to protect against swine plague than hog-cholera. It is easier to grant immunity and easier to cure. In order to have your experiments reliable it is necessary to make a complete diagnosis in order to get that. Dr. Peters did not tell us how he determined the fact that it was hog-cholera—I presume by investigations; but unless he is very much more expert than the bacteriologists—than those I relied upon in the government experiments—I must say that I do not see how he could reach positive conclusions, because in the outbreaks in the West sometimes we cannot find the hog-cholera germs at all, and in other cases we find swine-plague germs in the lesions of hog-cholera, and sometimes find both germs in the same animal, so that the results of experiments are more or less doubtful under these conditions, which are hard to guard against, and from which it is hard to get good and satisfactory results, even by the bacteriologist's exertions.

Dr. Kilborne: I have but one point to offer, and that is this: As I understood the essayist, in all these cases the whole herd was treated.

Dr. Peters: On account of the lack of serum and our inability to get it, we divided the herd and only treated one-half of it.

Dr. Kilborne: The point I wish to bring up is: in these cases of hog-cholera the first deaths will occur more or less suddenly; they will be followed by scattering deaths, and then the rest of the herd will make more or less rapid recovery. In only a few cases does the disease carry off the whole herd. But in applying any treatment to a herd where the disease has already broken out it would be impossible to tell whether the disease had run its course and that all the

deaths had occurred that naturally would where the whole herd is treated. I know of many cases where it has been tried with patent medicines on one or two or a few hogs, and with apparent success—I do not mean patent medicines, but the so-called specific—and the proprietors of the specific have jumped at conclusions and thought they had a specific, and have put it on the market as such. When such a remedy has been tested on healthy animals, or on herds that were divided, and by testing it upon one-half of the herd and leaving the other half without it, it is found that the specific is a positive damage.

Now, in the case of the serum, I sincerely hope that its use will prove successful, but at the same time I should want to get some results from it to show more conclusively that it had a positive curative or preventive effect. In treating with serum, if the herd was equally divided as far as possible, if an outbreak has occurred, by dividing the healthy—separating the healthy and the diseased into two lots equally, and treating one and leaving the other—if there is a marked difference between the treated and untreated, we can give the serum credit for it then. In another case healthy herds can be taken, as I believe several herds were taken; if one-half of the herd were treated and the other half untreated, then in case the disease broke out in the herd we would have some data from which to judge of the efficiency of the serum treatment. I know in a large number of experiments undertaken under my direction while at Washington, and from observations in the field, we found that we could place very little reliance on any results to be judged from where the whole herd was treated alike. In so many cases the deaths would cease where there was no treatment applied whatever. In other outbreaks deaths would continue; so that I would suggest that in order to show the efficiency of the serum we ought to have tests on divided herds—herds in which one-half of the animals are treated and the other half left—then the whole experiment will exhibit from the results what the serum in fact will do.

Dr. Gill: I know nothing about hog-cholera, so far as the application of serum is concerned. So far as toxins are concerned we are getting it very strong—three times as strong as we were before; and so far as the application of the serum is concerned, I think its use is more available as a preventive than as a curative, and I will give you an illustration. If a case of diphtheria is found in some orphan asylum or several cases, say the inmates number four or five hundred, the affected children are injected as well as the inmates, the

inmates being injected with a milder serum as a preventive, with a view to immunize them. And I notice that serum has to be given while they have sufficient vitality left. If a person or an animal is given serum after, say, the vitality has been considerably lowered, you get no good results. We have had several cases where we used tetanus antitoxin in horses, and if we injected the serum when we noticed the very first symptom we could effect a cure; but if it had advanced considerably, the effect of our serum was that we got no good results. I think you can use the serum more as a prophylactic than as a curative. If you are called upon to examine or treat a herd of hogs affected with hog-cholera, the disease has made such a progress that the vitality of the animal is lowered and the action of the antitoxin will be of no avail; that has been my experience; you must use the serum early to expect any good results; but I think as a prophylactic it is an excellent agent.

Dr. Peters: Replying to Dr. Salmon's remarks, I will say that I tried to make as accurate an examination of the hog-cholera germs as possible. We recognize the fact that there are two germs. But in the majority of cases in which it is proven to be swine plague the most virulent is found to be in the pulmonary form; but as I stated in my paper, we never pronounced a case to be hog-cholera unless we made the inoculation, the culture, and the microscopical test; then we were satisfied, as far as my knowledge was concerned, that it was a case of cholera. We are now trying to get our serum distributed over the whole State.

Dr. Stalker: The comparatively small value of the pig, its short life, the expense of doing the work, and all that, will, I think, conspire against its being a successful prophylactic for cholera. No matter how efficacious the serum may be, I have very serious doubts about its being successful with the present conditions. I am quite inclined to the belief that the restrictive measures—sanitary and police regulations, local restrictions that will interfere with and prevent the spread of the disease—have the greatest degree of value in them of anything yet presented for the benefit of the taxpayers. I do not mean to say anything to discourage the valuable experiments of Dr. Peters, and I am very glad to know that he is so interested in this important work, but I simply want to express my doubt that it will ever become successful.

A STUDY OF CATHARTICS.

By M. H. REYNOLDS, M.D., V.M.

THESE experiments as originally planned were on a very small scale and very simple; but the study became interesting, and the result has been sixty experiments with eserine and thirty-two with barium—others with aloes and with aloes and calomel. This has naturally resulted in the accumulation of a mass of statistics and observation notes, of which only summaries and conclusions can be given in a paper of this length. It must be remembered that a majority of these experiments were upon horses not sick, and are to be regarded as experiments in physiological effects rather than actual therapeutics.

The writer has thought best not to discuss the materia medica or theoretical therapeutics of the medicines used, but rather the results, comparisons, and ranges of usefulness.

DATA TAKEN.

PERIOD A.

Period A covers twenty-four hours before the time of administration.

Data taken: Pulse, temperature, and respiration at 12 M., 5 P.M., 10 P.M., 7 A.M. and 12 M. the second day.

Bowel discharges: Number from 12 M. to 5 P.M.; 5 P.M. to 10 P.M.; 10 P.M. to 7 A.M.; and from 7 A.M. to 12 M. the second day; total number for the twenty-four hours and total weight.

Dose given at 12 M.

PERIOD B.

Period B covers the twenty-four hours immediately after the time of administration.

Data taken: Pulse, temperature, and respiration at 12 M., 1 P.M., 2 P.M., 3 P.M., 5 P.M., 10 P.M., 7 A.M., and finally 12 M. at the close of period B on the third day.

Bowel-discharge record taken as follows: When the first discharge appeared which showed the effect of the dose; number of discharges from 12 M. to 1 P.M.; from 1 P.M. to 2 P.M.; from 2 P.M. to 3 P.M.; from 3 P.M. to 5 P.M.; from 5 P.M. to 10 P.M.; from 10 P.M. to 7 A.M.; and from 7 A.M. to 12 M. at the close of period B. Total number during the twenty-four hours of period B and the total weight of feces discharged.

In some cases a further period of twenty-four hours was added to the experiment and named period C. The purpose of this was to compare various medicines and doses in their effects as to condition of the feces, number, and weight of discharges during this period of twenty-four hours, and compare these with the period A; we then had an accurate record of the bowel discharges not only during this

period A, but also during two successive periods of twenty-four hours each after administration of the cathartic.

In this way I could get comparisons of the pulse, temperature, respiration, and bowel discharge records, taken at certain hours and for certain periods during the twenty-four hours preceding, with similar data taken during the twenty-four or forty-eight hours, as the case might be, succeeding the administration of the medicine and incidentally have the opportunity to study the subsequent effect of the medicine when the active catharsis had ceased.

It must be remembered that the horses used for these experiments were mainly not sick horses. Some were colics, impactions, etc. Those were purely experimental, however, which I used for comparisons and studies of physiological effects, for it is impossible to get two or more sick horses in conditions nearly enough alike to make the comparisons valuable. The hospital cases are all specified as hospital cases or H. C.

The writer feared that since these experimental horses were getting but moderate exercise in the yards, and, with few exceptions, no active work, this might lessen the value of the normal averages, which, for the bowel-discharge records, might be too low for both number and weight; and, again, their lack of active work might render them less susceptible to cathartics than working horses. To settle this point records were taken of thirteen work horses on the State farm.

TABLE A.—NORMAL BOWEL RECORD.

	Name. (Working horses.)	Age	Wt.	Condition.	Kind of work.	Feed.				Sex	Color.	Bowel discharges.					
						Hay.		Grain.				7 A.M. to 12 M.	12 M. to 5 P.M.	5 P.M. to 10 P.M.	10 P.M. to 7 A.M.	Total number.	Total weight.
						Kind.	Amt.	Kind.	Amt. p.day								
1	Baby,	6	1350	Good	Farm	Poor	Ad lib.	Oats	21	F.	Black	1	2	2	3	8	33
2	Daisy,	6	1350	"	"	"	"	"	21	F.	"	2	2	1	3	8	42
3	Fan,	6	1300	"	"	"	"	"	21	F.	Gray	1	1	1	1	4	22.5
4	Ned,	10	1200	"	"	"	"	Gr.fod.	18	M.	Bay	1	1	2	2	6	27.5
5	Maud,	7	1275	"	Heavy carriage	"	"	Oats	15	F.	Sor.	1	2	2	3	8	37
6	Dandy,	10	1200	"	Farm	"	"	"	18	M.	Black	2	1	2	2	7	33.5
7	Chub,	10	1200	"	"	"	"	"	18	M.	"	0	1	1	1	3	23
8	Frank,	6	1200	"	"	"	"	"	20	M.	Bay	1	1	1	2	5	25
9	Pat,	6	1200	"	"	"	"	"	20	M.	"	2	1	2	2	7	32
10	Harry,	20	900	"	Driving	Good	"	"	16	M.	Sor.	1	2	3	2	8	30
11	Josie,	8	900	"	"	"	"	"	15	F.	Gray	2	2	3	2	9	35
12	Brownie,	6	850	"	"	"	"	"	12	M.	Bay	3	2	3	4	12	33
13	Kit,	7	1200	"	Farm	Poor	"	"	18	F.	Gray	4	2	3	3	12	54
												Averages,				7.4	32.9

A comparison of their bowel records with my experimental horses in the hospital shows an average number of discharges per twenty-four hours of 7.4 and an average weight of 32.9 pounds.

TABLE B.—NORMAL AVERAGES.

No.	Name.	No. taken.	Bowel discharges.		Temp.	Pulse.	Resp.	Number of times temp., pulse, and resp. taken.
			No.	Weight.				
1	Harry	3	8.33	30.0	99.76°	32.9	15.4	3
2	Jim	7	9.8	28.1	96.9	34.4	17.0	3
3	Dick	16	8.6	37.4	100.1	41.0	12.3	57
4	Lady	6	10.5	23.9	100.3	40.0	12.6	18
5	Josie	2	9.5	34.7	.....	.....	.....	...
6	Jim, 2d	6	16.5	40.5	99.0	40.0	9.5	24
7	Dolly	1	22.0	35.0	99.8	42.0	16.0	3
8	Brownie	2	12.5	33.0	100.6	45.0	15.0	8
9	Nick	4	8.7	26.9	100.5	38.5	12.8	7
10	C. C.	10	9.1	30.2	100.3	43.2	14.0	15
11	Kenwood	6	8.0	30.5	100.1	39.2	16.0	12
12	Whitey	8	10.5	31.7	100.3	47.2	14.5	16
13	Prince	1	10.0	44.5	100.4	34.0	20.0	4
14	Dandy	1	11.0	40.0	101.0	48.0	16.0	4
	Hospital horses' average	.....	11.07	33.3				
15	Baby	1	8	33.0				
16	Daisy	1	8	42.0				
17	Fan	1	4	22.5				
18	Ned	1	6	27.5				
19	Maud	1	8	37.0				
20	Dandy, 2d	1	7	33.5				
21	Chub	1	3	23.0				
22	Frank	1	5	25.0				
23	Pat	1	7	22.0				
	Average of 23 horses	.....	8.3	31.8	99.9	39.7	14.6	

The experimental horses in the hospital—fourteen in number—show an average of 11.07 bowel discharges in twenty-four hours and an average weight of 33.3. In each lot there were a few that varied far from the normal, but it will be observed that the averages agree closely. When the averages of both lots are taken the results show the average number of discharges to be 8.3 and the average weight 31.8.

With some horses the series would begin with the maximum doses, and the smaller doses be given in series later. With others the first dose would be the smallest planned, and then progressively larger ones be given, in order that the possible source of error—decreasing susceptibility—might be discovered and checked. This gives a chance to compare a given dose of eserine, *e.g.*, with another dose consisting of the same eserine plus a variety of doses of pilocarpine, then eserine compared with eserine and atropine; then doses of eserine with the

best selected amount of pilocarpine compared with the same doses of eserine and pilocarpine plus atropine in the best selected amount, usually 0.05 grain; then this last dose is compared with another in which the eserine and pilocarpine are the same, but strychnine is substituted for the atropine. Each dose and the series comparisons duplicated with as many different horses as possible. The barium experiments give a chance to compare the most satisfactory eserine combinations with barium. Conclusions will be given later.

For the eserine experiments all doses are in grains on a standard of 900 pounds weight. The doses quoted in this paper are the doses a given horse would have received if he had weighed 900 pounds. This is done for the sake of speed and ease in comparing doses and results. As a matter of fact, the actual doses were in proportion to weight.

For all the barium experiments the doses were also given in proportion to live weight, but on a basis of 1000 pounds standard, and the doses are quoted as in grammes. I think that the majority of veterinarians are in the habit of estimating eserine doses in grains and the barium doses in grammes.

For the barium chloride 8 grammes were selected as the smallest dose per mouth, and 0.75 as the minimum dose per intravenous method. The per mouth series consisted of 8, 10, 12.5, 15, and in two cases 20 grammes. In some cases a dose would be given in bolus, then duplicated in solution to see if there was a material difference as to the method of administration. The series selected for the intravenous method was 0.75, 1. and 1.5 grammes in 10 per cent. solution. When the ideal dose proportion or balance of the medicines used had been decided, then this dose was to be given to cases in practice and records kept.

The Medicines. It frequently happens in the use of cathartics that the results are very unsatisfactory. It may be that results are wanting—a large dose is apparently without effect upon the bowel movements, or a small dose may act with unexpected and alarming severity. It may be that there is an extreme depression, painful peristaltic activity, severe muscular tremors, and so on, and the question becomes an interesting one why, in this particular case, the results were so very unsatisfactory. I shall try to answer some of these questions later.

TABLE C.—MEDICINAL DOSE.

Drug.	Pulse.	Respiration.	Temperature.	Arterial pressure.	Secretions.	Arterioles.	Vascular tone.	How eliminated.	Peristalsis.	Involuntary muscle-fibres.	Hollow organs.
Eserine,	—	x then —	o	— then x	*—x	...	...	Secretion.	x	x	(—)
Pilocarpine	†—	o	o	—	x	x	—	Secretion.	x	—	(—)
Atropine,	x	x then —	x	x	—	*(x)(—)	*—x	Secretion, especially urine.	*—x	*—x	
Strychnine,	x	x	o	x	x	(—)	x	Urine.	x	x	(—)
$BaCl_2$,	—	x	o	— then x	x	(—)	x	.....	x	x	

o. Nil.
—. Lessens or depresses.
x. Increases or stimulates.
*. Depends on large or small dose.
(—). Contracts.
(x). Dilates or expands.
†. Authors differ.

It will be noticed that all these medicines increase secretions except atropine in large doses, and that even it has this effect in small doses, and the same remarks apply to their effects on peristalsis. All stimulate contractions of involuntary muscle-fibres except pilocarpine, which has something of a reverse effect. Atropine stimulates the involuntary fibres in small doses and the reverse in large doses. Upon the hollow organs in general, eserine, pilocarpine, and strychnine contract them.

Barium. Bartholow says of barium, in his *Materia Medica*, in speaking of the physiological effects of barium chloride on the human, that in full medicinal doses it causes irritation of the stomach with sense of heat or burning at the epigastrium. One case is reported where symptoms of poisoning came on in one week after the administration of $\frac{1}{2}$ grain three times daily, the whole amount taken being $2\frac{1}{2}$ grains. The symptoms were extreme exhaustion and nervousness. He thinks a peculiar idiosyncrasy must have existed in this case or so small an amount would not have produced such pronounced symptoms. . . . He says the usual symptoms in cases of poisoning are intense anguish, free salivation, great thirst, loss of voice, vomiting, purging, dilated pupils, frequent micturition, respiration slow and labored, and slow pulse, increasing weakness, and finally complete paralysis of the extremities. The chief post-mortem conditions are pronounced rigidity, bronchial effusion, and hyperæmia of the lungs, heart distended, with black blood, and brain engorged. In the stomach intense hyperæmia, sometimes perfora-

tion; 2½ grains have produced serious symptoms; 1 drachm has caused death in seventeen hours and 1 ounce in one hour.

Large doses suddenly injected into the jugular cause paralysis of both heart and lungs; death is caused rather by paralysis of the respiratory muscles than by cessation of the heart-action. Paralysis in the lower animals begins at the lower extremities.

Barium causes strong cardiac contractions, dilated pupils, energetic peristalsis of the bowels, even closure of the lumen of the intestine and of the bladder, and almost complete approximation of the peripheral vessel-walls.

Let us study for a moment the criticism of a cathartic effect. What are the unsatisfactory results that may follow the administration of a cathartic?

We may have a fatal poisoning; the result may be less serious, but there may be extreme pain; there may be severe depression, severe muscular tremors, or an agent may be uncertain and results difficult to estimate. There may be actual constipation; the effect may be *nil*, or extreme purging and a possible enteritis; there may be a persistent and objectionable after-period of constipation when the cathartic action has ceased. A common and very unsatisfactory result appears in those cases in which there is at first a very active effect apparently, but the discharges are small, little but watery fluid passes, and there is little movement of actual feces. It is very common that after the administration of a cathartic there appear quite a number of discharges—many more than would have appeared under normal conditions; but the total weight of feces passed during the twenty-four-hour period may be very much less than would have occurred without the cathartic, and so whereas we wish to unload the bowels, as a matter of fact we may have accomplished just the reverse.

Ideal Catharsis. What constitutes an ideal cathartic effect? The answer to this must depend to a large extent on the object to be accomplished; but in general there should result the movement, during twenty-four hours, of from three to ten or more pounds of feces, more than would have occurred without the medicine during the same period; there should be a gain in number for this period of perhaps five; the pain resulting from the dose must be *nil* or moderate; there should follow slight or no after-constipation; there should be no extreme depression during the active catharsis, and I dislike very much the severe muscular tremors that sometimes follow the use of certain drugs. The drug should be such that there

is no danger of fatal or even alarming results in horses that we do not know as to their susceptibility.

Unsatisfactory results. Reasons. In studying unfortunate and unsatisfactory results of eserine we must not forget that there are two alkaloids in the calabar bean which are diametrically opposed in physiological effects, and that a commercial sample of eserine is liable to be contaminated with calabarine. Again, eserine in the presence of acids takes up water and changes to eseridine, which has at the best but one-sixth the activity of eserine. These alkaloids are quite easily separated because of their differing solubilities. For instance, eserine is soluble and calabarine insoluble in ether.

When using pilocarpine it must be remembered that jaborandi also has two alkaloids that are antagonistic in physiological effects, and that pilocarpine is changed into jaborine by oxidation or by heat alone. Jaborine is more easily soluble in ether and less easily soluble in water than pilocarpine. Commercial pilocarpine may be contaminated with jaborine. We must not blame pilocarpine too readily; the fault may not be in the pilocarpine.

Again, patients vary greatly in susceptibility to all the drugs commonly used for cathartic effects. Drugs may be old and have deteriorated, or they may be adulterated. In cases wherein several drugs are used—for instance, in hypodermic cathartics—in which either or all of those used in my experiments may be given, the combination may be a poorly balanced one—for instance, in combining eserine or pilocarpine, or both, with atropine. The addition of a very small amount of atropine, say 0.05 or 0.04 of a grain, may be very desirable, whereas if the dose had been increased to 0.1 grain the eserine is neutralized to such an extent as to make that amount of atropine very objectionable. Too much of a drug may be given, or too little, for satisfactory results. Finally, in considering the results of a cathartic which has been unsatisfactory, we should not lose sight of the condition of the bowels at the time of administration. The condition of the stomach, after a full feed or before, may have much to do with determining a cathartic effect, as, for example, barium experiments 1, 2, and 3.

We were all taught when we were students, I have no doubt, that when a horse is feverish and consequently constipated that effects are apt to be slow and indefinite; that a horse should never have a full purgative when weak from pre-existing illness or depressed from any cause; that purgatives should be administered with extreme care in inflammatory diseases of the respiratory organs,

and very rarely when any portion of the alimentary canal is suffering from an inflammation.

Of 98 experiments the following have been quite unsatisfactory: Eserine experiments, 6, 9, 12, 13 (fatal), 14, 17, 19, 20, 21, 22, 23, 26, 30, 32, 37, 40, 48, 53, 55, 56, 58; also barium experiments, 16, 19, 24, 28, and 32. (For doses and results, see Tables D, E, and F.)

E. (13). Brown horse; poor condition; quite old; weight, 1200 pounds. Dose, 3 grains eserine at 12 M. This horse was poor and weak and supported in slings at the hospital at the time of this experiment. On the basis of 3 grains per 900 pounds this horse actually received 4 grains. The purpose of the experiment was to study the effect of such a dose upon a horse in his condition, and then to post-mortem the horse and study the effect upon the mucous membrane involved. This was evidently a very sick horse from the time the medicine took effect until he was dead. The disturbance was in general *violent*, such as a practitioner would not care to see in actual practice. The pain was very severe, and the feces effect also very severe, with six discharges during the first hour and thirteen during the first three.

Post-mortem: Subject "John." Died suddenly at 5 P.M. Post-mortem at 5 P.M. November 14th. Normal except as noted; only alimentary canal was examined. *Cæcum*—Arch and also meso-cæcum show large, bright blush, with somewhat darker pin-head spots. *Large colon*—First portion and suprasternal flexure similar but less marked. *Ileum* shows same condition, practically whole length. *Jejunum* terminal, $\frac{1}{2}$, same condition. The congestion or hyperæmia involved noticeably the muscular coat. As normals could not be obtained for this experiment, the writer was therefore unable to make comparison of them with those obtained under effect of medicine. Feces, first catharsis at 12.35; 6 during the first hour, 5 during the second, 2 during the third, 1 from 3 to 5; died at 5 P.M. Total number to that time, 15. Total weight, 9.07 pounds. Tenesmus evident during the whole time after the effect of medicine appeared until horse died. Slight pain at 12.25. Considerable gas. Began perspiring very freely at 12.40, which continued until death. At 5 o'clock, just before dying, the heart-action was irregular and violent, with pulse 36 and weak. Dropped suddenly into slings and died.

B. experiment (11). Illustrates a rather large dose of barium with *poisonous effect* in a peculiarly susceptible horse. Dose, 15 grams

at 7 A.M. in bolus. This experiment is interesting in that the horse died, and a post-mortem was obtained showing some interesting developments. Feces recorded for twenty-four hours: Period A, 8 discharges; weight, 32 pounds; normal in all respects. Horse in good health. Period B, first discharge at 7.35; 6 the first hour; 14 the second; 8 the third; 11 from 10 A.M. to noon; 12 from noon until 3.30 P.M. Died at 3 30. Total number for the $8\frac{1}{2}$ hours, 51; weight, 50 pounds. Temperature not materially varied; pulse 60 at 10 A.M.; 54 at noon. Respiration 42 at 9 A.M.; 48 at noon. Slight tenesmus between 7.50 and 8.40; uneasy at 8.45; lay down at 9 o'clock; no excessive pain from 9 until noon. Feces very thin; commenced trembling at 3.30; struggled; fell suddenly at 3.32; struggled to her feet again after considerable effort; immediately fell on left side; leg and body-muscles quivered spasmodically; died very suddenly.

Post-mortem record of Kenwood (*black mare*). Thoracic cavity and contents apparently normal. Omitted to examine interior of œsophagus. Stomach shows two very distinct areas of intense local inflammation (both in right cul-de-sac and greater curvature). Mucous membrane swollen and purple in two spots just the shape and size of the barium balls; borders sharply defined. She had lain down several times during operation of the physic, and we noticed she would stagger a little and tremble slightly for a moment after rising. She had also acted in the same way during operation of her last dose of barium.

Jejunum and ileum normal. Mucous membrane of cæcum and first, second, and third portions of the colon (less marked on fourth portion) mildly congested. Small colon and rectum filled with soft feces, consistence of cow's feces, dirty gray color. Feces about this same condition throughout the entire canal, all soft and uniform. Very little feces in the small intestines, but throughout this portion there was a great abundance of fluid about the consistence of gravy and about the color of light blue clay. Peritoneal surface of the diaphragm nearly covered with little patches of organized fibrinous exudate—possibly the result of some pre-existing peritonitis, but singularly local.

Brain-substance and meninges apparently normal, except a congestion of each choroid plexus and a decided congestion of the pia mater and inner arachnoid around inferior portions of the cerebellum. The inferior surface of all three lobes of the cerebellum deeply reddened, with raised, swollen appearance—could easily separate a

thin layer from this portion of the cerebellum that resembled a blood-clot, quite firm, difficult to tear.

B. Experiment (32). Shows an interesting result from intravenous use of barium. *Severe local swelling.* Dose, 1 gramme, intravenously, 10 per cent. solution. Feces record, Period A, twenty-four hours; number 8; weight, 22 pounds; normal. Period B, total number, 12; weight, 12 pounds. A distinctly constipating effect. Pain moderate; effect on pupils, *nil.* This experiment was continued during the third period of twenty-four hours, C, to study the effects of this dose upon the feces records, with the following

Stomach. Barium experiment (11).

results: Total number, Period C, 8; weight, 28 pounds. A very unfavorable showing from Period B, when the cathartic effect should have been active. A large swelling slowly appeared on the side of the neck and extended downward perhaps eight inches, and upward about two inches from the side of injection. The next day after injection it was about one foot long and five inches wide, and perhaps an inch and a half above the level. The swelling did not seem painful or annoy the horse, and went down by the 24th. No abscess developed. Horse in good health, eating and feeling well all the time. The vein was not obstructed, as shown by pressure

below the swelling. The needle entered the vein easily, and the blood flowed through the needle very freely, showing that the needle was unquestionably in the vein. The horse stood quietly for the injection, and it is almost impossible that any barium should have been injected outside the vein. In view of this the swelling is difficult to account for.

Unsatisfactory experiences with barium reported by others. (See *Journ. Comp. Med. and Vet. Archiv.*, vol. xvii. No. 7, Mollereau; *Ibid.*, Ries; *Berliner Wochenschrift*, No. 24; *Ibid.*, No. 27; *Vet. Journ. and An. Comp. Path.*, vol. xli. No. 246, Nemo; *Veterinary Magazine*, vol. iii. No. 2, Treacy; *Am. Vet. Review* (from *Berl. Thier. Woch.*), vol. xx. No. 1, Bieser; *Journ. of Comp. Med. and Vet. Arch.*, vol. xvii. No. 9, Plaskett; *The Veterinary Magazine*, vol. iii. No. 7, p. 445, Cary.)

TABLE D.—HYPODERMIC TABLE.

Abbreviations explained at the foot of the table.

Dose.	Name.	Exp. No.	Bowel discharges.					
			No.	Weight.	Pain.	F. effect.	1st hour.	1st 3 hrs.
E .5	Jim, 2d,	19	*17 15	*32.5 32.5	o	o	3	3
"	Dick,	22	8 11	30 37	o	o	1	3
E .5 P 1	Jim, 2d.	20	14 12	25.5 32.5	o	o	3	3
E .5 P 2	Dick,	23	8 6	37.5 ...	o	o	0	1
E .75	Lady,	35	9 10	20 28	o	x	1	4
E 1	Jim, 2d,	18	18 46	47.5 76.5	x	xxxx	6	30
"	Josie,	48	10 9	37 24.5	o	— C	1	1
"	Dick,	27	10 10	50 32.5	o	x	2	5
E 1, P 2	Dick,	24	7 14	32 41	o	xx	1	6
E 1, P 2 A .25	Dick,	30	8 9	38 34.5	o	— C	0	0
E 1, P 2 A .08	Dick,	31	10 7	39.5 34.5	o	x	3	0
E 1, P 4 A .08	Dick.	32	10 7	39.5 34.5	o	— C	0	1
"	Dick,	33	10 10	31.5 36.5	o	o	2	2
E 1 P 4 A .04	Dick,	34	11 10	38.5 41	o	x	2	3
E 1.5	Jim, 2d,	17	17 49	47 53	x xxx	See rec. 17 xxx	20	42
"	Josie,	50	9 11	32.5 34	x	o	2	2
"	Dick,	28	8 25	32.5 36.5	xx	xx	16	22
E 1.5, P 2	Dick,	25	9 11	33 35	x	x	2	5
E 1.5, P 4 A .05	C. C.	55	8 13	29 31	See rec. xx	x	Mistake 2	in A. 2
E 1.5, P 4 A .05	C. C.	57	8 13	34 37	xx	xx	3	4
"	Whitey,	56	12 14	40 37	x	— C	Mistake 0	in A. 1
"	Whitey,	58	9 14	31 40	xxx	xx	5	7
"	Kenwood,	54	10 14	33 34	o	x	3	8
E 1.5, P 4 A .14	Dolly,	31 A	... 0	... 0	o	o	H. C. Im 0	paction. 0
E 1.5, P 4 S .5	Lightfoot,	46	... 18	... 25	x	xx	7	17

Dose.	Name.	Exp. No.	Bowel discharges.					
			No.	Weight.	Pain.	F. effect.	1st hour.	1st 3 hrs.
E 2	Jim, 2d,	21	*15 57	*... ...	xxxx	xxxx	15	47
"	Dick,	29	7 37	39.5 46.5	x	xxx	17	28
"	Jim,	4	16 15	39 32	x	x	0	3
E 2 A .05	Whitey,	59	14 22	42 44	xx	xx	5	7
"	C. C.,	60	12 23	42 42	x	xxx	7	9
E 2, P 2	Jim,	7	9 18	39 37	xx	xx	6	14
"	Jim, 2d,	15	18 47	50 51	xxx	xxx	17	38
"	Dick,	26	8 23	47 52	xxx	xx	13	20
E 2, P 2 A .2	Dolly,	30 A	... 2	... 4	xx	x	H. C. Im paction. 2	2
"	Dick, 2d,	38	... ...	... ...	o	o	H. C. Im paction. 0	0
E 2, P 2.5 S .5	Jim,	11	9 40	26.8 31.5	xxx	xxx	11	35
E 2, P 4	Lady,	37	9 27	23.5 26	xxx	xx	See re cord. 14	21
E 2. P 4 A .05	Lady,	43	11 19	29 32.5	xx	xx	10	16
"	Lady,	49	13 12	24.5 28	xx	o	3	3
"	Dick, 2d,	39	... ...	... ...	o	x	See exp. record. 0	4
"	Dick,	36	10 25	38.5 36	x	xxx	15	19
"	C. C.,	51	8 23	19.5 36	xx	xx	9	14
"	Whitey,	52	15 15	32.5 40	xx	xx	7	8
"	Kenwood,	53	9 29	33 42	xx	xxx	4	20
E 2, P 4 S .25	Lady,	47	*10 32	*26 24.25	x	xxx	15	26
"	Dick,	44	11 22	33 42	o	xx	7	17
E 2, P 4 S .5	Lady,	45	11 16	20.25 25	xx	xx	2	14
"	Dick, W. W.,	41	... 13	... 21	o	xx	4	12
"	Dick,	42	9 32	38 54.5	o	xxx	20	28
E 2.5, P 2.5	Jim,	9	4 27	19.3 27.2	xxx	xxx	4	25
"	Harry,	8	7 14	25.7 31	xx	xx	5	12

Dose.	Name.	Exp. No.	Bowel discharges.					
			No.	Weight.	Pain.	F. effect.	1st hour.	1st 3 hrs.
E 2.5 P 2.5 A .1	Jim,	10	*10 13	*15.3 20.3	x	x	2	7
"	Jim, 3d,	16	13 20	40 45	x	xx	5	10
E 2.5 P 1.5 A .25, S 1	Jim,	12	10 10	20.3 25	o	o	0	0
E 3	Harry,	5	... 19	... 33	xxx	xxx	3	16
"	Jim,	6	11 30	37 33	xxx	xxx	10	24
"	John,	13	15 ...	9 ...	xxxx	xxxx	6 Died.	13
"	Jim, 2d,	14	5 56	10 55	xxx	xxx	4	39
E 3, S .1, A 1	Cow,	40	... ...	... ...	— C o	o	0	0

TABLE E.—$BaCl_2$, PER MOUTH.

Dose.	Name.	Exp. No.	Bowel discharges.					
			No.	Weight.	Pain.	F. effect.	1st hour.	1st 3 hrs.
8	Kenwood,	1	6 9	28 27.5	o	x	1	3
8	Whitey,	3	7 19	23 49	o	xxx	3	15
8	C. C.,	2	7 14	22 46	o	xx	2	8
10	Kenwood,	4	8 52	28 48	xxx	xxx	1	19
10	C. C.,	5	13 15	40 25	Mistake x	in dose. x	26 hours. 0	26 hours. 0
10	Dolly,	15	23 19	35 33	o	xx	4	9
10	Brownie,	14	— 13	— 26.5	o	x	1	2
10	Nick,	16	9 11	27 23	o	o	1	4
10	Dandy,	29	11 16	40 42	o	x	3	4

* Total numbers and weights of bowel discharges for Periods A and B in each experiment.

E. Eserine. P. Pilocarpine. A. Atropine. S. Strychnine.

o. Nil. xx. Severe or decided.

x/2. Very slight effect. xxx. Very severe or decided.

x. Slight effect. xxxx. Extreme.

F. effect. General cathartic effect. H. C. Hospital case.

1st hour. Number of bowel discharges during the first hour after giving dose.

1st 3 hours. Number of discharges during the first three hours after giving dose.

Doses quoted are on basis of 900 lbs. weight and expressed in grains.

Dose.	Name.	Exp. No.	Bowel discharges.					
			No.	Weight.	Pain.	F effect.	1st hour.	1st 3 hrs.
12	Kenwood,	6	*7 49	*29 43	x	xxx	6	32
12	Whitey,	8	11 11	34 32	o	o	0	1
12	C. C.,	7	10 28	31 36	x	xxx	4	18
11.6	Nick,	19	9 11	27 ...	o	— C	1	2
12.5	Queen,	9	... 13	... 53	o	x	1	4
12.5	Brownie,	20	14 11	32 ...	x/2	x	1	2
12.5	Brownie,	27	11 13	34 44.5	xx	Active 12 M. to 5 P.M. xxx	0	1
12.5	Nick,	25	9 14	29.5 37	o	x	1	4
12.5	Kit,	24	12 12	54 57	o	o	0	1
12.5	Prince,	26	10 34	44.5 84	Gaunt and much depressed afterward. x	xxxx	3	10
15	Kenwood,	11	8 51	32 50	xx	8½ hrs. then died. xxxx	6	28
20	Whitey,	13	11 28	26.5 51	xx	Active 12 M. to 5 P.M. xxx	0	2
15	C. C.,	12	9 48	31 40	xx	xxx	13	35
15	Queen,	10	... 11	... 40	o	x	0	0
19.1	Nick,	23	8 14	24 33	x	x	1	3

TABLE F.—$BaCl_2$, INTRAVENOUS.

Dose.	Name.	Exp. No.	Bowel discharges.					
			No.	Weight.	Pain.	F. effect.	1st hour.	1st 3 hrs.
0.75	Whitey,	18	10 16	33 34	o	xx	9	12
0.75	C. C.	17	11 30	28 32	x/2	xx	12	20
1	Whitey,	21	12 24	39 40	o	xx	11	12
1	C. C.,	22	9 28	37 42	x/2	xxx	14	15
1	Nick,	32	8 12	22 12	xx	— C	1	4
1	Dandy,	31	16 20	37 27	x/2	x	7	9
1.5	Whitey,	28	12 14	42 35.5	xxx	xx	7	9
1.5	C. C.,	30	11 43	41.5 42	x/2	xxx	28	38

Abbreviations same as in Table D.
Doses quoted on a basis of 1000 weight and expressed in grammes.
Doses administered in 10 per cent. solution.

The following comparisons are made in view of similar doses, the differences being only such as necessary to furnish the desired data. The number of bowel discharges for twenty-four hours, the weights of the same, the pain effect with general disturbance, and the general bowel effects. The number of discharges during the first hour after the administration of the medicine, or after the first appearance of the cathartic effect, and the number during the first three hours after that time, are also considered. (See Tables D, E, and F.)

As to the *value of pilocarpine* in connection with eserine, the comparison of experiments (5) and (8), (28) and (24), (28) and (25), (29) and (26), (27) and (24), (4) and (7), (6) and (9), (21) and (15), (59) and (52), (60) and (51), (60) and (57), making a total of eleven comparisons, shows six in favor of pilocarpine and five in favor of eserine alone.

A few of the experiments seem to show distinctly in favor of pilocarpine; with the others the comparison is but slightly in its favor. On the whole, the comparison is not strongly in favor of pilocarpine.

Eserine alone, as compared with eserine and atropine. A comparison of experiments (21) and (59), (29) and (60), (4) and (59), (5) and (59), (6) and (60), (13) and (59), (14) and (60)—a total of seven comparisons—shows six strongly in favor of atropine and one with results about equal.

NOTE.—All the comparisons in this paragraph, of eserine with eserine and atropine, are with different horses, and should not, therefore, be estimated at the same value as though the compared doses had been given to the same horse for each comparison. It seems quite clear, however, that atropine in very small doses makes a desirable addition to eserine.

Eserine as compared with eserine, pilocarpine, and atropine. The comparison of experiments (29) and (51) (different horses); (17) and (57) (different horses); (5) and (43) (different horses); (4) and (53) (different horses); (28) and (54) (different horses); (21) and (52) (different horses); (27) and (31) (same horse); (27) and (33) (same horse); (29) and (36) (same horse); (27) and (34) (same horse); (48) and (34) (different horses); (18) and (31) (same horse), making a total of twelve comparisons, with seven distinctly in favor of pilocarpine and atropine, three in favor of eserine alone, and two with results practically equal. On the whole, the comparison is decidedly in favor of the combination.

Eserine and pilocarpine as compared with eserine, pilocarpine, and atropine. A comparison of experiments (9) and (10) shows distinctly

in favor of atropine; (37) and (43) also distinctly in favor of atropine.

Eserine and pilocarpine as compared with eserine, pilocarpine, and strychnine. A comparison of experiments (7) and (11), (37) and (45), (37) and (47), (15) and (11), (26) and (11), making a total of five comparisons, with two strongly in favor of strychnine; two distinctly in favor of strychnine; and one with results about equal.

Eserine, pilocarpine, and atropine as compared with eserine, pilocarpine, and strychnine. A comparison of experiments (43) and (47), (43) and (45), (36) and (62), (36) and (44), (52) and (47) (different horses); (54) and (46) (different horses); (51) and (44) (different horses); (57) and (46) (different horses)—a total of eight comparisons, seven strongly in favor of strychnine and one with results about equal. The whole comparison is strongly in favor of the strychnine in the matter of weights of actual feces moved, number of discharges, and permanence of effect. (See Tables D, E, and F.)

With hypodermic cathartics the item of balancing the medicine used is very important, especially with atropine and strychnine, too much of either being objectionable and too little without effect.

I have endeavored to make a comparison of eserine combinations with barium chloride, using moderate and representative doses of each. These comparisons are selected at random, some of them being upon the same horse and quite a number with different horses. I wish to emphasize the fact that I do not attach much importance to comparison of different cathartics on different horses in isolated cases, but if a number of experiments can be gotten together the general averages mean something. Another lot of comparisons, selected at random might vary the results to some extent, but not a great deal.

A comparison of E. 59 (dose, eserine 2 gr., atropine 0.05 gr.) with B. 3 (dose, 8 grammes per mouth) shows distinctly in favor of the barium.

A comparison of E. 60 (dose, eserine 2 gr., atropine 0.05 gr.) with B. 2 (dose, 8 grammes per mouth) shows results practically equal, the weight somewhat in favor of barium.

A comparison of E. 58 (dose, 1.5 eserine gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 8 (dose, 12 grammes per mouth) shows in favor of the eserine, but both very unsatisfactory.

Comparison of E. 52 (dose, eserine 2 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 21 (dose, 1 gramme intravenously) shows

slightly in favor of the barium; pain in favor of the barium; weight of feces in favor of the eserine.

Comparison of E. 51 (dose, eserine 2 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 22 (dose, 1 gramme intravenously) shows very strongly in favor of the barium.

Comparison of E. 54 (dose, eserine 1.5 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 1 (dose, 8 grammes per mouth) shows results practically equal.

Comparison of E. 53 (dose, eserine 2 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 4 (dose, 10 grammes per mouth) shows strongly in favor of eserine.

Comparison of E. 43 (dose, eserine 2 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 15 (dose, 10 grammes per mouth) shows slightly in favor of the eserine (different horses).

Comparison E. 36 (dose, eserine 2 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 32 (dose, 1 gramme intravenously) shows very strongly in favor of eserine (different horses).

Comparison of E. 47 (dose, eserine 2 gr., pilocarpine 4 gr., strychnine 0.25 gr.) with B. 28 (dose, 1 gramme intravenously) shows strongly in favor of eserine (different horses).

Comparison of E. 44 (dose, eserine 2 gr., pilocarpine 4 gr., strychnine 0.25 gr.) as compared with B. 8 (dose, 12 grammes per mouth) shows strongly in favor of eserine (different horses).

Comparison of E. 45 (dose, eserine 2 gr., pilocarpine 4 gr., strychnine 0.5 gr.) with B. 7 (dose, 12 grammes per mouth) shows distinctly in favor of barium (different horses).

Comparison E. 41 (dose, eserine 2 gr., pilocarpine 4 gr., strychnine 0.5 gr.) with B. 30 (dose, 1.5 grammes intravenously) shows strongly in favor of the barium (different horses).

Comparison E. 42 (dose, eserine 2 gr., pilocarpine 4 gr., strychnine 0.5 gr.) with B. 31 (dose, 1 gramme intravenously) shows strongly in favor of the barium (different horses).

Comparison E. 53 (dose, eserine 2 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 6 (dose, 12 grammes per mouth) shows slightly in favor of the barium, both nearly ideal; both pain and weight slightly in favor of the barium (same horse).

Comparison of E. 57 (dose, eserine 1.5 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 17 (dose, 0.75 grammes intravenously) shows strongly in favor of the barium, especially as to pain (same horse).

Comparison E. 58 (dose, eserine 1.5 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 18 (dose, 0.75 grammes intravenously) shows

results practically equal; pain in favor of the barium; weight of feces in favor of the eserine.

A total of seventeen comparisons: seven in favor of the eserine combinations, seven in favor of barium, and three with results practically equal—a remarkably even comparison for experiments selected at random.

I have endeavored to select only such experiments as illustrate moderate doses wherein the effects were reasonably representative. It is evident that with the intravenous use of the barium the results are more uniform, and there is a greater uniformity among different horses as to susceptibility than when this drug is administered per mouth.

When we compare the newer cathartics—eserine and barium—with aloes as to the actual amount of feces moved, uniformity of satisfactory results when used solely for cathartic effect, uniformity of susceptibility, and in any case when the element of time is not all important, the result is very much in favor of the latter. Especially is it true in the matter of actually unloading the rectum and colon. The cathartic effect seems to last longer, the pain disturbance is uniformly less, with no muscular tremors under ordinary circumstances. There is no objection to aloes as to possible heart-complications; there is but a slight tenesmus under ordinary circumstances and much less after-constipation than with either eserine or barium. In any case, when I have time to wait, my preference among these is decidedly in favor of aloes for horses.

General comparison of eserine, pilocarpine, etc., compared with barium. In the item of expensiveness the comparison is decidedly in favor of barium. Permanence of chemical form greatly in favor of barium. Ease of administration in favor of the eserine. Promptness of effect is, first, in favor of the barium per intravenous method; next, in favor of the eserine hypodermically; third, in favor of the barium per mouth. As to cathartic results, considering numbers and weights of discharges, the decision is uncertain, results being practically equal. The comparison as to pain-disturbance is in favor of the barium. Muscular tremors stand distinctly in favor of the barium. I think the comparison as to certainty of cathartic effects is in favor of the eserine, for I have found several horses that did not respond to large doses of barium. It is true that horses vary somewhat in susceptibility to eserine, but not to the extent as with barium. I have never found any horse in normal condition that did not respond to reasonable doses of good eserine.

When we compare the two in reference to the possibility of serious or even fatal results, the comparison is very much in favor of the eserine.

As to the disturbance in temperature, pulse, and respiration, neither has shown any uniform results. As to the after-effect upon the bowels I am not prepared to express an opinion. My experience with the two drugs gives me the impression that with repeated doses of eserine the susceptibility increases and with barium it decreases; but this is not given as an assertion of fact.

As to dosage: The smallest dose of eserine which has given good results was 1 gr. (see E. 18). The largest dose of atropine which has allowed satisfactory results has been 0.1 gr. (see E. 16). I consider the largest dose of eserine advisable under ordinary circumstances to be 3 gr., and would usually give less.

In using strychnine with the eserine we should not use more than 0.5 gr., and usually but 0.25 gr. I believe this commonly increases the amount of actual feces moved and adds to the desirable effect of the eserine. Ordinarily I would not use more than 0.05 gr. atropine.

As to pilocarpine, I am skeptical as to its value in connection with eserine.

As to barium, I would not give less than 8 grammes nor more than 15 grammes per mouth, and not more than 1.5 grammes intravenously, nor less than 0.75 grammes per 1000 pounds, if I was anxious to have definite results. Since the experience with B. Exp. 11, and also with the horses "Brownie" and "Prince," the writer is somewhat afraid of barium in bolus or capsule. When using barium in solution, an ordinary dose should be dissolved in from six to eight ounces of water.

The intravenous injection of barium chloride is feasible in general practice without the employment of fine technique.

Three to 5 c.c. of air have been injected several times without noticeable effect. I have only known one case of serious local trouble among all that have been reported with the exception of my own (B. 32).

The physiological effects which writers on human materia medica describe—depression of the temperature and slowing of the heart, etc.—have not been manifested in these experiments; neither any posterior paralysis, except in the fatal case (B. 11), and no case of peculiar posterior lameness such as others have reported.

My experience with hypodermic cathartics, of which eserine forms

the basis, and with barium, gives me the opinion that both are useful, but should not replace the old cathartics.

Barium is useful, but not the ideal, harmless drug of magic power and accuracy for simple catharsis or the treatment of colics which some of our friends would lead us to think.

DISCUSSION.

Dr. Bell: It is a subject that is attracting a great deal of attention, and the opinions with regard to the effects of the various combinations are as numerous almost as the experiments. I think that almost all veterinarians experiment with the various combinations and make up their minds which they are most fond of, according to their experience, and finally settle to one form of treatment. As regards my own experience, I have had but little with these combinations, preferring, in all cases where possible, to rely upon the old, and which I consider the most reliable form of treatment.

Dr. Gill: I have had the same experience as Dr. Reynolds in the use of barium chloride and eserine. We cannot always depend upon getting the same results. I have found in giving a regular dose of eserine to a horse to get those symptoms spoken of by Dr. Reynolds, and also in barium-chloride treatment, I prefer to use, and do use to a great extent, the alkaloid aloin. It is more easily prepared and more stable and reliable. The bad effects of the drug, such as pain, etc., are not as great with aloin, and I rely almost entirely on it in my practice where I need a slow cathartic—that is, in relation to the other alkaloids on it.

Dr. Rechtenwald: In my use of these drugs the horses die so quick under the influence that I cannot get time to see its effects.

Dr. Reynolds: I hope I have not conveyed a wrong impression to this body: that I have condemned either barium or eserine. I want to say that I consider them both useful, but I specially want to take away the unreasonable amount of credit and confidence that we have given to barium.

PHYSIOLOGICAL VARIATIONS.

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In biological study we generally identify form with function, but sometimes their relations are vague, at others they wholly elude our perception, yet we usually assume the interdependence of anatomy and physiology.

We are not clear as to which is cause and which is effect, although as a rule we attribute physiological or pathological phenomena to structural differences, but it seems more probable that the reverse is true, and that anatomical peculiarities are due to physiological variations. We attribute the form of the ruminant to rumination, not rumination to the complexity of the stomach; carnivorous teeth to the devouring of flesh, and not flesh-eating to the form of teeth, yet, knowing the functions of these organs, we may refer an animal to a given order by their form. In animal physiology, whether normal or pathological, it is important that in so far as possible we comprehend each function in its true light and not erroneously ascribe physiological peculiarities to irrelevant details in structure.

It is a current practice in medicine, not wholly unknown in other professions, to attempt to answer all questions propounded with some plausible theory, which, if it does not explain, serves at least to cover up some very rugged points, and so we attempt frequently to explain the occurrence of physiological or pathological phenomena by some imaginary or irrelevant anatomical detail. A good example of this recklessness in formulating theories is the common explanation given of the occurrence of roaring in horses by attributing it, and its usual seat on the left side, to the disposition of the left recurrent laryngeal nerve; but when we recall that other domestic animals, in none of which roaring occurs, have the same disposition of the nerve, it is evident that we must look further for an explanation, and conclude that the existence of roaring in horses is dependent rather upon some physiological variation than anatomical peculiarity. Closely allied in many respects is the peculiar equine malady, which,

in a paper presented to this Association in 1894, I termed *enzootic spasm of the larynx*—a disease attributed by me at an earlier date to the eating of frozen maize, by others to feeding on Indian vetches, and by still others to poisoning through the use for drinking of mill-tailing waters. None of the causes proposed offer any explanation for the limitation of the disease to solipeds and the impunity with which other animals may eat frozen maize or Indian vetches or drink the tailings from smelters or ore-mills.

Of greater interest, because of its more general prevalence and consequent economic importance, is the disease of solipeds known as "heaves," a malady which has led to many theories and controversies but to no reliable conclusion as to its nature.

Putting these three together, they constitute an isolated group of diseases confined to solipeds and almost wholly to horses, mysterious in nature and without prototypes in other animals unless we except the asthma of man; yet we find no anatomical reason why solipeds should monopolize to the exclusion of other animals the entire group of functional respiratory affections.

Another well-marked peculiarity of the horse which is very lightly but ineffectually explained is the rarity of vomition, which it is said is due to the peculiar palate or the arrangement of the cardiac orifice of the stomach, so that he *cannot* vomit. We can tie a dog's œsophagus so he cannot vomit, but if we give him emetin it will still induce nausea, and in the production of nausea rests the real difference between the two animals, for any of us of moderate experience knows full well that if a horse be nauseated he can vomit readily.

I have seen a horse sit on his haunches like a dog and vomit until certainly his stomach was well emptied, yet there seemed little amiss except the nausea, after the subsidence of which he appeared as well as usual. Again, I have been frightened to see the free vomition of decomposing food in a severe case of indigestion, in which the vomit was mixed with considerable quantities of blood, yet the vomition had apparently the salutary effect observed so often in dog and man.

We must then search for the rarity of vomition in the horse in the peculiar difficulty with which he becomes nauseated.

Each animal offers specific affections, which are as well marked and as closely defined by specific boundaries as those above mentioned, and their existence in or confinement to a given species cannot at present be explained except by some physiological peculiarity of the animal.

The semiology of disease is frequently very much modified by the functional peculiarities of the patient.

In the ordinary pneumonia of the horse the patient cannot lie down comfortably, while in the same disease the cow habitually assumes the recumbent posture with ease. Of greater physiological interest are the more essential symptoms produced by diseases alike essentially in etiology and nature, yet causing the most diverse effects upon the patient according to age, species, or other factors.

Indigestion in the horse produces pain and delirium; in the foal, pain and diarrhœa; in the cow, coma and paralysis; in the infant or puppy, convulsions; and while we may recognize certain differences in food or other causative factors, they do not fully account for the great variations of essential symptoms.

In the realm of transmissible affections we find a still more interesting example in rabies or hydrophobia, the cardinal symptoms of which in nearly all animals is intense fear, coupled with discordant efforts to protect self from imaginary foes, but we find this symptom strangely perverted in some animals. The sheep may attack rather tamely by butting, but its most marked symptom of the malady is nymphomania, although normally its sexual desires are ephemeral and never so intense in health as is observed in the bitch and cat, and strangely, too, the fact that the ewe is pregnant is no bar against the nymphomania.

The rabid pig shows no nymphomania, and, as observed by me, no attempt whatever at attack or defense, but rather tries by backing and whirling to get away from the imaginary foe.

Individual peculiarities are constantly observed in disease, and may prove interesting or confusing. I recall a case of colo-cæcal impaction in a mare where the ordinary extreme extension of the limbs as if to urinate was replaced by the animal standing on its hind legs with its forefeet propped up on a nail-tie at the side of the stall, about five feet from the floor, thereby accomplishing in a measure the ordinary effect as to position in a grotesque manner.

In the physiological action of drugs and medicinal agents we find great variations which we must constantly take into account, and not accept the behavior of a given agent in one animal as conclusive proof that it will act likewise in all others. Such an assumption frequently leads us to conclusions no less dangerous than false. In a paper presented to this Association last year[1] I had occasion to

[1] Therapeutics of Colic.

refer to the variation in the action of opium and morphine in the horse and man, being in the former, when given in large doses, a violent and dangerous excitant to the spinal cord and respiratory apparatus, while in man it generally poisons by producing coma; consequently if we accept the normal physiological action of the drug in man as our guide for its use in the horse, after passing a given dose which may have a slight anodyne action, we quickly reach an excitant effect, which is rapidly and dangerously intensified by increased doses, leading many veterinarians to destroy the lives of their patients in the vain attempt to reproduce the action of this drug as seen in man. But opium is by no means the only medicinal agent offering perplexing differences in action, which we can only attribute to physiological peculiarities in the various animals. This is particularly noticeable in our use of cathartics. Magnesium sulphate, so prompt and in many respects effectual in man and several of our domesticated animals, when uncombined is not only ineffectual in cattle, but under certain conditions seems rather to retard than encourage intestinal activity, although if combined with a liberal amount of sodium chloride it becomes quite efficient. We explain this deviation from the normal action of magnesium sulphate by saying that the addition of the sodium chloride increases the animal's thirst and thereby proves a valuable adjunct to the magnesium; but this does not explain why the adjunct is essential in cattle and uncalled for in man. Similiar variations hold true in the action of other purgatives, which, while not so well marked, lead us to elect certain members of the entire group for each of the various species of domesticated animals and even for the various ages and breeds.

The physiological peculiarities of animals which determine the pathogenic power of living organisms offer an interesting field for investigation. One phase of this topic was suggested but not considered in a paper presented to this Association in 1894 upon the "Influence of Climate and other Environments upon the Character and Distribution of Disease," in which it was noted that many diseases possess well-defined geographical limits depending upon climatic or other influences. These influences evidently may act either subjectively or objectively; they may weaken or destroy the pathogenic organism or increase or decrease the resisting power of the animal to be attacked, which latter we must attribute to variations in the functional peculiarities due to environment—changes which must be constantly taken into account in every department of our

science. A disease which is a serious scourge in crowded quarters or under certain climatic influences may prove utterly insignificant under other conditions.

In the paper above mentioned it was noted that the physiological conditions of range horses at high altitudes in our Western States rendered glanders among them an almost non-contagious affection, with a marked tendency in those affected to recover spontaneously. At the same time animals kept in bad stables in the adjacent valleys and put to hard work contract glanders readily and severely.

Since other diseases show equal variations under changed climatic conditions, a study of these become essential not only in veterinary sanitary science, but also in the daily work of the private veterinarian.

We fully recognize that animals strengthened or depressed by food, labor, or housing possess varying powers of resisting the encroachment of disease, and that these same influences enable or disable an animal to undergo a given surgical operation.

In transmissible diseases the powers of species or individuals to resist the inroads of the pathogenic organism form one of our most intensely interesting studies. It is noticeable that but few of these affections have even a moderately wide specific habitat.

Anthrax, tuberculosis, rabies, and glanders present the widest range of possible existence, while most transmissible affections are confined to a genus or species. Thus Texas-fever, bovine pleuro-pneumonia, equine pleuro-pneumonia, equine distemper, canine distemper, hog-cholera, chicken-cholera, and a long list of such maladies have closely defined specific limits except possibly under artificial conditions. The functional causes which render one species vulnerable, another immune to given diseases, are already producing profound results in the domain of medicine, although the fundamental facts are not yet discovered. We fully recognize the value of physiological resistance to disease in the selection of animals for the artificial production of immunizing or curative agents. It is greatly to be hoped that the present intense activity in biological study will yet discover the causes of physiological immunity of one species against diseases to which another is highly vulnerable.

The crowning achievement of modern medicine is the artificial production of immunity against a disease to which the individual is ordinarily liable. While immunity as a result of the invasion of disease in a tangible form has long been recognized, it has been only recently that this immunization has been intelligently produced

without the advent of the disease. The production of immunity by disease has always been regarded as a very grave danger in many diseases, few patients passing safely through the ordeal necessary to the physiological change, while the immunization without the presence of the actual disease has greatly lessened the danger and also has taught us undeniably, what many believed before the recent discoveries, that many patients acquire immunity against a given disease without exhibiting any of the cardinal symptoms of the affection, or, we might say, the patient has been invaded by a pathogenic organism which has produced the physiological changes we call immunity without producing the functional discord which we term disease.

Furthermore, we may consider the possibility of the production of physiological variations which may become hereditary, resulting in permanent, specific immunity, by which all the individuals of a species may become invulnerable to a given disease—a proposition which, although at first apparently untenable, yet seems quite as plausible as the great anatomical changes which we generally admit have taken place during a long series of generations. The multiplicity of pathogenic organisms besetting us on every hand would render higher animal life impossible but for very general specific immunity. We can realize the importance of the physiological peculiarities which cause this immunity by observing the seriousness of the already mentioned group of affections having a wide specific range of habitat, chiefly tuberculosis, anthrax, glanders, and rabies. All are much dreaded and constitute the most difficult group of affections to control or eradicate, largely because of their ill-defined specific limits, although none of them is exceedingly highly contagious, and each seems to have its climatic limitations.

The vast number of highly contagious and fatal maladies, such as hog-cholera or chicken-cholera, were they not confined to certain species by what we conceive to be physiological immunity, would inevitably sweep higher animal life out of existence, thus rendering immunity against a large proportion of pathogenic organisms in each animal a necessary safeguard to the survival of its species. In what manner the physiological changes are brought about by which specific or hereditary immunity ensues, little is known; but it seems not improbable that it is largely the same, but in a more gradual manner, as the individual immunity produced by the first attack of disease.

It appears that constant contact with certain pathogenic organisms

begets gradual immunity without intervention of that train of phenomena we designate disease, so that while an animal is kept in unsanitary environments which weaken the normal resisting powers of the body, it affords, by habit, protection against those forms of disease the causes of which are constantly present and acting, so that an animal subjected to unsanitary conditions tends to acquire more or less immunity against these, but the reduced general vitality renders the system all the more vulnerable to new foes, as in case of the people in the slums of great cities, whose systems become inured to the dangers which are constant and withstand them in an extraordinary degree, but the advent of new ones, like typhus or cholera, causes appalling destruction.

Reptiles and batrachians revel among miasms and pathogenic organisms which would prove deadly to many other forms of animal life; and carnivorous and especially scavenger animals wax strong upon food teeming with decomposition-bacteria and their products, which would prove of serious consequence if ingested by others.

It is not unreasonable to believe that the physiological modifications induced by environment fixes in a degree the ability of various animals to undergo successfully certain physical injuries or surgical operations, which, possessing certain definite characters and being more or less uniform, offer special facilities for comparison. We find functional characters so greatly varying that operations which can be borne with impunity by one species of animal can be undertaken in others only with considerable danger; in one animal aseptic precautions are needful and imperative, in another they are wholly unnecessary. Take, as an example, operations affecting the body-cavity. In man or horse these can only be undertaken under the most scrupulous aseptic precautions; in the common fowl we cut in between the ribs without asepsis, spread the ribs apart, remove the testicle in sight, then probably break into an air-sac or two, break through the mesentery, search for awhile for the other testicle, then roll the bird over, cut between the ribs on the other side, secure and remove the remaining testicle, and turn the bird loose with a large opening passing entirely through the body from side to side, through the abdominal cavity, with considerable blood-coagula left without removal, and the air-sacs punctured so that essentially the lungs have been opened. The patient misses no food, loses no flesh, and apparently pays no heed to the ordeal through which he has passed. In other words, the chicken possesses immunity against wound-infections to a high degree. Several domestic animals possess a degree

of immunity against wound-infection only slightly inferior to the fowl. The dog is especially resistant in this respect, so that the bitch is habitually spayed in utter disregard of aseptic precautions, sanitary surroundings, or surgical neatness, yet successfully and safely. Yet some writers advise great nicety in asepsis, anæsthesia, etc., in this operation, although their reasons for such careful technique do not appear; but we would not have it thought we counsel abandon and recklessness in the matter. We do hold, however, that it is our good fortune that complete asepsis is not imperative when we consider the difficulty with which it may be applied, and there is scant need for insisting upon so much labor to produce it for an operation not worth the trouble. Others say it is cruel to spay a bitch without first producing anæsthesia, but anæsthesia is more dangerous to the life of the bitch than the operation. Still another writer insists that the operation at best is cruel, but spaying a bitch causes less suffering and loss of flesh than giving birth to a single litter of puppies or even to going through a single period of œstrum; and it is consequently wrong to gauge our operations on dogs by the results of similar procedures on animals possessing quite different physiological properties.

While we as veterinarians must recognize the importance of asepsis in our handling of surgical or accidental wounds, we are not to be discouraged nor prevented from carrying out an operation because of the impracticability of applying aseptic or antiseptic rules with that exactness demanded in human surgery.

Wishing to try the economic value of spaying range mares, upon looking up the literature relating thereto it was found that one of my colleagues stipulated that the vagina should be scrupulously disinfected on the day prior to the operation, then again upon the day of operation, and that the procedure itself should be carried out under the most exacting rules: all blood-clots removed from the vagina, the vaginal incision sutured, and every possible precaution taken against wound-infection. My subjects, however, were wild mares, which must be lassoed and tied securely head and foot for the disinfection, released for a day, and then caught again for redisinfection and operation. The excitement of catching and the rough handling would offset the imperfect disinfection, and, moreover, the wild mares were not worth the expense. It was essential that a more practical method should be adopted, and consequently they were roped and forced into a branding chute, secured in a standing position, the feces removed from the rectum by an assistant; about

one quart of a 1 : 5000 or less sublimate solution was thrown into the vagina, the incision quickly made, the ovaries taken away with the ecraseur, the blood-clots in the vagina left there, the vaginal incision left open, and the wild mares released ; and, to my astonishment, it was found that the animals withstood the operation better than yearling colts do castration.

We also recognize physiological variations in breeds and individuals, and find that we must gauge our remedy and dose, must undertake or decline an operation, and must be guided in our prognosis by the functional peculiarities of the patient before us. In every department of our profession we need to closely follow the physiological peculiarities of our wards and to intelligently base our actions upon a practical study of their normal functions, and not to rely upon what we term general or classic physiology, which is made up of a series of deductions drawn from facts gleaned indiscriminately from the whole field of animal life and not always having a general application.

NAIL-WOUNDS OF THE FOOT.

By S. B. NELSON, V.S.

It is my desire to discuss this subject under the followings heads :

1. The anatomy of the foot.
2. Simple wounds.
3. Serious wounds.
4. Symptoms and diagnosis of nail-wounds.
5. Treatment.
6. Sequels resulting from nail-wounds.

Anatomy. The anatomy of the foot will be reviewed in brief; the hoof, which is the external horny covering of the foot, may be divided into three parts, as follows : the wall, sole, and frog.

The wall is that portion of the foot that we can see when the foot is placed flatly on the ground.

The sole and frog form the entire bottom of the foot, with the exception of the small portion of the wall which is doubled on itself, and forms the bars; the frog is a mass of soft horn, triangular in shape; it fills a notch in the posterior part of the sole, its apex pointing forward; the sole is flat and circular, with the exception of the notch just mentioned; it joins with the entire lower border of the wall.

Between the bars and the frog are deep creases that are named the lateral lacunæ. In the posterior part of the frog is another, which is known as the middle lacuna.

The keratogenous membrane is a continuation of the skin, forming the lining of the hoof and the covering of the internal parts of the foot, which are the lateral cartilages; plantar cushion—sometimes called the soft or internal frog—because it is softer in texture, is nearly an exact counterpart of and situated just above the external frog; the os pedis and the os naviculare; the inferior attachments of the tendons of the perforans and the anterior extensor of the phalanges, muscles, to the os pedis; besides there are the ligaments, nerves, and bloodvessels.

Now I would like to give you some measurements from the points of the foot, where nails are most liable to penetrate: the sole is from three-eighths to one-half inch thick anywhere over its surface; also in the anterior part of the lateral lacunæ the distance to the os pedis is about one-half inch, while in the posterior two-thirds of the lacunæ the distance gradually increases to one inch; over the anterior third of the frog the distance through to the os pedis is two-thirds to one inch; from there back it is two inches through the frog and plantar cushion to the navicular joint. From above the bulbs of the heels downward and forward it is also two inches to the bony structure.

These measurements will often assist in the prognosis of the case if the distance that the nail entered can be ascertained; for instance, if the nail entered three-fourths of an inch at the apex of the frog or at the centre of the frog, will make some difference in the prognosis and treatment, as the first entered the os pedis, while the second only pierced the plantar cushion.

Simple Nail-wounds. Simple nail-wounds are those where the nail has simply punctured the sole or frog and has not passed to the bony structures or the lateral cartilages; it may have passed into the plantar cushion. The exception to this is that when the puncture is close to the joint the inflammation resulting causes suppuration, which extends to the synovial membrane and which will result in an open joint.

Serious Nail-wounds. Serious wounds are those where the nail has penetrated to the os pedis, bruising it or detaching a small spicula of bone, or the nail may have pierced the synovial membrane and entered the navicular joint, or the nail may have passed outward, injuring the lateral cartilages; from the latter open joint often results, as the internal surfaces are in close proximity to the synovial membrane.

Symptoms and Diagnosis. The diagnosis of nail-wounds are generally quite easy, as the symptoms are plainly marked, and very often the owner or driver witnesses the accident, but just as often do they neglect to notice or they forget before they call advice whereabouts in the foot the puncture is. It is here that the hoof-searcher comes into prominent use, and it will nearly always locate proximally where the nail punctured the foot. The entire foot should now be washed perfectly clean and the hoof-knife used to pare the foot until the puncture is found, which will show itself as a black spot in the light-colored horn.

In those cases where no history is obtainable and the patient is seen standing on the toe, fetlock flexed, and continually pointing forward with the foot, look for a nail-wound. There may also be a slight swelling just above the hoof, which sometimes extends to the fetlock.

The first step in the examination is to feel the pulse in the large metacarpal artery if the lameness is in the front foot, or in the metatarsal artery if in the hind foot; because if the lameness is an acute one and in the foot, the pulse will locally beat hard and full—it will thump—it is easily distinguished from the pulse in the other limb.

The foot is hot to the touch. Now the hoof-searcher should be used, the foot cleaned, and the paring-knife or sage-knife used.

It is not enough to pare the foot until pus is found, but the entire side of the sole should be pared to know whether the injury is from a bruise or from a nail-wound. This is important to ascertain, as the owner often wishes to know, if possible, the cause of the injury.

Should a patient be brought to you for treatment—one that has a small, running sore at the bulb of the heel, in which by probing you find a small foreign substance—do not immediately pronounce it a gravel; it may possibly be a nail that has entered at the posterior part of the lateral lacuna, passed upward and backward, lodging in the plantar cushion, which makes the animal only slightly lame. Search the foot to see if it is a nail that has entered from below as just described, and it may save you the discomfiture of withdrawing the nail, head last, from the heel, when you could just as well have drawn it out head first from the bottom of the foot.

Prognosis. If the injury has occurred inside of a circle two inches in diameter, whose centre is one-half inch posterior to the apex of the frog, it is quite likely to be a serious wound, as it only has to enter less than one inch to injure the os pedis. Behind this area, unless the nail has been forced in over two inches, the wound is not likely to be a serious one.

It often occurs that a correct diagnosis and prognosis are essential and of value to the owner of the patient, as at present he must know if it will be for his best interests financially to have the animal treated.

Outside of the two regions mentioned nail-wounds are rare, because the shoe protects the balance of the foot.

It is sometimes the case that an animal paws over an object from which nails protrude, forcing the nail into the foot above the bulbs

of the heel; this generally makes an ugly wound; but whether it is a serious wound or not depends upon its proximity to the navicular joint.

TREATMENT. The different wounds need somewhat different treatment, depending on the severity of the wound; yet they are all dealt with on the same general plan. First, the foot should be washed to the fetlock with an antiseptic solution; the best is probably a solution of corrosive sublimate—one part in a thousand parts of water. It has fine antiseptic properties, is neat, inexpensive, and can be handily carried in tablet form. Creolin or lysol instead of the corrosive sublimate.

Next, the wound itself must receive attention. It has been an open question whether a nail-wound should at first be left alone or should be well opened. I always thin the horn for a good distance around the wound, and at the same time remove all the loose horn in the wound. This gives a nice, open wound, which, if without any complications, will heal under treatment in twenty-four to forty-eight hours; while if it had not been opened, the animal in many cases recovers from his lameness for three or four days—that is, until pus forms—and then he becomes lame again, and now the treatment may necessitate the animal's absence from work for several days.

After the wound has been washed with the antiseptic wash, the dressings are to be applied; this will first be iodoform, placed in a little gauze and soaked in the corrosive sublimate solution, because, while the iodoform is antiseptic, it is not aseptic; over this is placed a dressing of antiseptic gauze, and then all is covered with a layer of absorbent cotton, which has been soaked with the sublimate solution.

If the animal has plenty of time to recover before he is needed for work again, a triangular bandage is put over the dressing; but if he is to be used as soon as possible, then instead of the bandage he must be shod, and a plate placed over the shoe:

This consists of a steel plate the shape of the shoe, which will cover the bottom of the foot. It has in front a T-raise, which slides between the shoe and the hoof; the rest of the plate fits over the ground surface of the shoe, and is retained by means of two square-headed screws that are screwed into the heels of the shoe.

This protects the injured foot from being bruised during travel over the roads. Retain the dressings perfectly, so that no foreign matter can reach the wound, making aseptic surgery possible on the

sole of the foot. It is easily removed by means of a small key when the dressings are to be reapplied, and will allow of the application of running water over the limb, if there is much inflammation present, without disturbing the dressing in the least.

After twenty-four to forty-eight hours an astringent wash is to be used to assist in hardening the exudate that is formed from the keratogenous membrane; the zinc sulphate and lead acetate solution, commonly known as white lotion, is very good for this purpose.

In the wounds where the position is over the navicular joint and where the nail has penetrated a considerable distance, first thin the sole or frog around the wound to relieve the pressure from the inflammation which may ensue. With this also crease the hoof, with the texture of it, to lessen the pressure laterally.

These wounds should not be probed, because if the synovial membrane has been punctured the discharge can be seen, and if not punctured might result from the probing, which would, of course, complicate matters.

The wound is to be well opened for drainage, as there may be considerable suppuration.

If the joint is open, the wound, after being cleansed, is dressed with powdered zinc sulphate on a fairly solid linseed-meal poultice, and this is covered with oakum and secured with the plate, thus doing away with the necessities of bandages that sometimes, no matter how carefully and securely they are put on, will be pawed loose or torn off. This dressing should be changed twice daily at first; later on once daily will suffice until the discharge of synovia stops.

Should exuberant granulations form in the wound and extend beyond the horn, as often happens, apply powdered nitrate of lead to them. This does not seem to affect the healthy tissue, and is more easily controlled than the liquid escharotics. Later the dressings should consist of astringent washes.

After the foot has been creased, apply fish-oil to it to assist in retaining the moisture obtained from the poultices and wet dressings.

Slings should be in readiness, so that if necessary the patient may be placed in them on a moment's notice; or, if the patient is not under the immediate care of the veterinarian, he should be put in them at first if the wound is at all serious.

The internal treatment will depend on whether the animal suffers great pain, has fever, condition of the appetite, physical condition, etc.

If there is pain, one of the various opiates is indicated. Morphine is probably the best; for the fever, some antipyretic is to be administered; the appetite is to be coaxed with different foods, but no food is to be allowed to remain before the animal from one meal to another; the bowels are to be kept in a fairly loose state; they must not be allowed to become constipated; if the patient is or becomes emaciated, administer tonics in some form, as iron, gentian, ginger, nux vomica, or arsenical compounds.

SEQUELS. The sequels that may result from the serious wounds are: Ossification of the lateral cartilages; contraction of the foot, both quarters or only one; quittor. For the latter it may be necessary to operate; but I will not take time to describe the operation, as I wish to mention a treatment for the others, and that is creasing the hoof as you see in the specimen before you. The hoof is oiled with fish-oil twice daily for one week, and then it is creased in the direction with the growth of the hoof; generally three creases are made in each quarter and a circular one at the union of the wall with the sole; the oiling is continued two or three weeks longer, when it may need be creased again as the hoof grows.

I hardly need to state that under this treatment the animal is to be shod with a plain shoe and not a bar shoe, as the latter will not allow the foot to expand as the plain shoe will.

FEEDING OF MILLET AND MILLET DISEASE.

By T. D. HINEBAUCH, V.S.

Mr. President, Members of the Association: In the fall of 1893, at the thirtieth annual meeting of the United States Veterinary Medical Association, and the first International Veterinary Congress of America, I read a paper on the same subject. In that paper we described lesions which we had every reason to believe were due to the feeding of millet; but as these animals died outside of our immediate care, there arose a chance for an argument regarding the conditions which we found present on post-mortem.

In order to secure further evidence relative to the influence of millet upon horses when used exclusively as an article of coarse food, we began another series of experiments, beginning on the 5th of December, 1894, using for our purpose No. 3, a black mare, aged, weighing 1035 pounds, and a bay mare, No. 4, six years old, weighing 1100 pounds. The results of those experiments, in a tabulated form, will be found on pp. 210, 211, as they have previously been published in the *Veterinary Magazine* for October:

On January 1, 1895, we discontinued taking observations, but continued to use millet as a food, giving both of them what they wished to eat. At the beginning of the experiment the black mare was sound to all appearances, and the most critical examination did not reveal a diseased condition of either muscular or osseous structure. The bay mare had previously suffered with navicular arthritis to a slight degree, and on December 25, 1893, I performed neurotomy for the relief of the lameness—the low operation being the one employed.

The hind legs were sound, and the most thorough examination failed to show a diseased condition.

On going to the barn, February 7th, No. 3 was found standing in the centre of the floor trembling violently, having some time during the night broken her halter. When led back to the stall she moved with great difficulty, showing extreme lameness and tenderness of the hock-joints, and on February 10th had great diffi-

culty in getting up; laid down during the night of February 10th and 11th, but was unable to get up the next morning. With the assistance of three men we succeeded in getting the animal to stand, but she could not stand alone. The symptoms gradually wore off, and at 3.30 P.M. she began to stand without any help. At that time the hocks were swollen, tender, and sore to the touch, appetite gone, action of the kidneys arrested; she had not passed urine during the last twenty-four hours; refused to eat anything except a little bran until February 16th, when she again began to eat millet, but very sparingly, not taking hold of it in such a manner as to indicate a relish or even desire to eat. She gradually continued to grow better with returning appetite until March 11th, when at seven o'clock in the morning she was again seized with violent trembling, and on examination of the stall it was found that the secretions of the kidneys had again been arrested, there being no passage of urine since the previous morning. She refused to eat, and gradually recovered until the evening of April 2d, when she was again noticed to be ailing. During the night she lay down, but was again unable to get up without assistance. After being assisted to rise she stood, showing great lameness in the hind legs, and when she was led out to be killed at 2 P.M. on April 3d moved with great difficulty.

By a close observation of the foregoing notes it will be seen that previous to each attack the kidneys had failed to secrete, and the appetite was gone. In one attack—that of February 10th—she absolutely refused to eat any solid food until the 16th. During all this time she gradually grew better, showing that nature attempted to overcome the distressing effects produced by the feeding of millet.

Post-mortem Examination. Contents of the abdominal cavity, including the intestines and liver, in normal condition as far as we could determine with the naked eye; the thoracic cavity the same. An examination of the various joints of the body, as far as we opened them, did not show a single one in which the cartilage covering the end of the bones was not injured to a greater or less extent. The cartilage of the tibio-astragaloid articulation of the left hock-joint showed deep furrows running in a direction parallel with the motion during flexion and extension. Both grooves of the astragalus were partially denuded of cartilage, so that the corresponding elevations of the tibia which articulate in the grooves did not have cartilage interposed between them. The whole general

appearance, instead of being a bright, whitish, glistening color, was of a dark, dull color, bordering on brown.

The synovial fluid, which escaped from the joint when opened, instead of being of an amber color, was brown and contained red blood-corpuscles, indicating that inflammation was present.

On making an incision in the right hock-joint the synovial fluid which escaped was of a much more brownish-black color, and also contained red blood-corpuscles. The cartilage had been removed in several places, and in one spot in the centre of the articular groove of the astragalus the bone had become pitted, showing that the disease had been present for some length of time. The other joints, including the pastern, fetlock, stifle, and both the head of the femur and acetabulum of the hind extremity, and also the pastern, fetlock, knee, elbow, shoulder-joint of the front extremity and occipito-atloido articulation, showed conditions similar to those which have been described as existing in the hock-joints. The muscular and ligamentous attachments seemed to be firm, at least they could not be detached by traction, except those of the right hock-joint. This undoubtedly was due to the extent of inflammation which was present.

During the progress of our investigation we received a letter from Dr. H. D. Paxson, of Wilmington, Del., which is here appended :

WILMINGTON, DEL., May 18, 1896.

T. D. HINEBAUCH, V.S., Fargo, N. D.

DEAR DOCTOR : Since reading your articles upon the subject of millet disease in horses I have had two cases in my practice which correspond, I think, to your description of the disease. I will recite what I can of the cases.

On March 30th last I was called to see a bay mare, weight about 1200, aged, and owned by Mr. Klund, of this city.

The disease had been noticed for three weeks prior to this. She had been stiff-gaited behind, gradually getting worse. When I saw her she was standing in the stall, with back arched, her weight behind resting on her toes, and with a pained expression. Had her taken out and walked. This was done with difficulty and caused her great pain. She walked entirely on toes behind, the heels not touching the ground. The gait was straddling.

I diagnosticated it sprain of the loins, not with much positiveness, however, and advised that she be destroyed, as she was old and had the heaves very badly. The owner objecting, I prescribed a liniment and had her put in slings. I did not see her again.

Date.	Time of day.	Temp. of air.	No. 3. Black Mare. Aged.									No. 4. Bay Mare. Six Years Old.								
			Temp. Fahr., horse.	Water, lbs.	Hay, lbs.	Oats, lbs.	Salt, ozs.	Urine, lbs. and ozs.	Specific gravity.	No. of urinations.	Weight of horse.	Temp. Fahr., horse.	Water, lbs.	Hay, lbs.	Oats and bran, lbs.	Salt, ozs.	Urine, lbs. and ozs.	Specific gravity.	No. of urinations.	Weight of horse.
1894 Dec. 5	A.M.	16.5°	100.2°	16	6.5	2				2		100.6°	9.5	6	2				0	
	N.	39	100	27	6.6	0				2		100.8	9.5	7	0				1	
	P.M.	37	100.2	6.6	7	2	1	8–1	1056	2	1035	99.4	8.6	7	2	1	1–5	1061	0	1100
6	A.M.	38	100.2	13.5	6.2	2				4		100.4	11.6	6	2				2	
	N.	45	100.4	13.5	6.5	0				1		100.4	13.5	7	0				0	
	P.M.	41	100.6	18	7	2	1	8–1½	1056	2	1033	100.4	9	7	2	1	3–0	1055	0	1101
7	A.M.	20	100.4	32.2	6.	2				4		100.4	9	6	2				3	
	N.	37	99.8	10	6.2	0				1		100.4	9.5	7	0				0	
	P.M.	36	100.6	8	7	2	1	7–1	1057	2	1042	100.2	11	7	2	1	3–14	1059	0	1102
8	A.M.	32	100.2	32.5	6.5	2				4		100.2	10	6	2				2	
	N.	26	100	9	6.3	0				1		100.6	17.5	7	0				0	
	P.M.	25	100.4	4	7	2	1	5–7	1060	2	1045	100.2	10	7	2	1	8–3	1060	1	1107
9	A.M.	24.5	100	36	6.5	2				4		100.6	15	6	2				3	
	N.	31	100.4	1	6.5	0				1		100.6	6.5	7	0				1	
	P.M.	32	100.4	25.5	7	2	1	8–8	1059	2	1047	100	15	7	2	1	1–2½	1053	0	1105
10	A.M.	31.5	100	7.5	6.5	2				4		100.4	6	6	2				3	
	N.	32.5	100.2	19	6.5	0				1		100.4	15.5	7	0				1	
	P.M.	32.5	100.4	12.5	7	2	1	7–7½	1056	2	1044	100.2	10	7	2	1	5–3	1061	1	1107
11	A.M.	30.5	100	27.5	6.5	2				4		100	20	6.5	2				4	
	N.	33	100.2	10.5	6.5	0				2		100.4	5	6	0				1	
	P.M	32	100.4	9	7	2	1	7–13	1060	1	1047	100.2	6	7	2	1	4–2	1065	1	1116*
12	A.M.	30	100.4	51.5	7	2				5		100.2	25	6	2				5	
	N.	31	100.2	9	6	0				2		100.4	11	7	0				1	
	P.M.	27	100.2	12	7	2	1	11–0	1052	2	1050	100	14	7	2	1	5–13	1056	2	1117
13	A.M.	11.5	100.2	36.5	5	2				7		100.4	16	6.5	2				5	
	N.	32	100.4	7	5	0				2		100.4	24	5	0				1	
	P.M.	32	100.6	13.5	7	2	1	15–5	1045	2	1052	100.8	5.5	7	2	1	11–3½	1053	1	1115
14	A.M.	26.5	100.6	38	5	2				7		100.4	18	5	2				6	
	N.	38	100.6	12	5	0				2		100.6	15.5	5	0				1	
	P.M.	32	100.4	10.5	7	2	1	17–6½	1043	2	1055	100.6	12	5	2	1	13–15	1054	1	1117
15	A.M.	15	100.4	32	6.5	2				7		100.2	10	5	2				5	
	N.	23	100.6	14	5	0				2		100.6	14	6.5	0				1	
	P.M.	25	100.2	15	7	2	1	25–9	1038	2	1050	100.8	15	5.5	2	1	18–½	1040	1	1118
16	A.M.	20	100.4	37	5	2				6		100.6	19	5	2				5	
	N.	22	100.2	3	4.5	0				2		100.4	13	5	0				1	
	P.M.	14	100.2	12.5	6	2	1	28–6	1028	2	1050	100.6	11	6	2	1	25–6	1031	2	1106
17	A.M.	10.5	100.4	32	7	2				5		100.2	7	6	2				5	
	N.	25	100	12.5	5	0				2		100.6	22	6	0				1	
	P.M.	31	100.4	25	5	2	1	27–1	1030	2	1047	100.6	11.5	7	2	1	20–1½	1040	2	1104

			°	°								°									
18	A.M.	18	100.2	16.5	6.5	2				6		100	14	5	2				2		
	N.	30	100	27.5	5	0				1		100.4	11	5	0				2		
	P.M.	29	100.5	7.5	6.5	2	1	17–5	1035	5	1050	100.6	13	7	2	1	21–5½	1039	1	1110	
	A.M.	20.5	100	33	5.5	2				4		99.6	95	6.7	2				3		
19	N.	40	100.4	22	6	0				3		100.4	24	6.5	0				2		
	P.M.	38	100.4	16	6.5	2	1	19–2½	1040	2	1049	100.6	6.5	7	2	1	25–6½	1040	1	1110	
	A.M.	31	100	13.5	6	2				4		100.4	13.5	6.7	2				3		
20	N.	41.5	99.4	28	6	0				2		100.8	20	6.5	0				1		
	P M.	43.5	100.6	8.5	7	2	1	21–2½	1040	3	1054	100.6	7	6.8	2	1	18–15	1048	2	1115	
	A.M.	19	100.4	28	6	2				4		100.6	17½	6.7	2				3		
21	N.	14	99.2	19	6	0				3		100.4	7.5	6	0				2		
	P.M.	11	100.8	11	7.2	2	1	17–2½	1043	2	1055	100.1	17.5	6.8	2	1	14–10.5	1050	2	1120	
	A.M.	8	100.4	37	6.8	2				4		100.4	15	6.2	2				4		
22	N.	17	99.8	15.5	6	0				2		100.4	10.5	6.2	0				2		
	P.M.	19	100.6	21.5	6.8	2	1	13–6½	1045	1	1054	100.2	10	7	2	1	20–9½	1060	1	1118	
	A.M.	27	100.6	18.6	5.8	2				4		100	14	7	2				5		
23	N.	32.5	99.8	32	6.5	0				1		100.8	25	6.2	0				2		
	P.M.	32.5	100.6	14	6.5	2	1	20–14½	1045	2	1049	100.8	8	6.7	2	1	17–3½	1051	2	1120	
	A.M.	15.5	100.4	28	6.5	2				3		100.4	10	6.3	2				4		
24	N.	15.5	99.8	14	5	0				2		101	16	6	0				3		
	P.M.	9	100	30	6	2	1	23–10	1040	3	1047	100.8	9	...	2	1	21–13	1045	3	1117†	
	A.M.	3	100.6	7	7	2				4		100.6	7	7	2				4		
25	N.	6	100.6	26	6.8	0				1		100.6	15	7	0				1		
	P.M.	8	100.4	3.5	6.8	2	1	16–15	1038	2	1050	99.8	2	7	2	1	16–6	1045	2	1116	
	A.M.	1	100.2	5	6	2				3		100.6	7	6.7	2				3		
26	N.	— 3.5	99.4	37	6.6	0				1		100.2	13	6.5	0				2		
	P.M.	—11	99.4	2	7	2	1	15–15	1039	2	1055	.....	7	7	2	1	9–2	1060	1	1117	
	A.M.	—20	99.6	25	7	2				2		100.2	8.5	7	2				3		
27	N.	—16.5	100.4	24	6.2	0				2		100.4	16	6.7	0				2		
	P.M.	— 5	100.2	2	6.8	2	1	10–15	1048	2	.....	100.8	16	7.2	2	1	12–7	1055	2	1120	
	A.M.	1	100	4.5	6.8	2				3		100.4	2	6.8	2				4		
28	N.	18.5	100	37	6.6	0				1		100.6	16	6.8	0				1		
	P.M.	13	100.2	2	7	2	1	9–11	1044	2	.....	100.8	6	7	2	1	7–10	1062	2	1116	
	A.M.	14	100	12	6	2				2		100.2	13.5	7	2				2		
29	N.	14	101	27	7	0				2		101	13.5	7	0				2		
	P.M.	7	100	1	7	2	1	11–5	1047	2	.....	101	5	...	2	1	9–12½	1062	2	1114‡	
	A.M.	6	99.6	32	6	2				4		100.8	10	6.8	2				4		
30	N.	9.6	99.6	20	7	0				2		100.8	15	6.5	0				2		
	P.M.	1	100	15.5	6	2	1	10–1	1046	2	.....	101	16.5	6.8	2	1	10–7	1054	3	1117	
	A.M.	7	99	19.5	6	2				4		100.8	19	6.5	2				5		
31	N.	12	100	17	6	0				2		101	14	6.8	0				2		
	P.M.	6	100.4	16	7	2	1	19–15	1042	3	.....	100.6	13	7	2	1	16–11	.....	3	1117	
1895	A.M.	.....	100	15	7	2				5		100	12	6.6	2				5		
Jan. 1	N.	.....	100.2	24	5	0				1		100	18	6.6	0				2		
	P.M.	.....	.....	25	7	2	1	18–11	1047	2	.....	101.8	10	7	2	1	15–15	.....	3	1120‖	

* Hay changed to first feed of millet. † Millet to hay, first feed. ‡ Hay changed to millet, first feed.
‖ Millet was just nicely headed out, secured in good condition. Records were taken at 6 A.M., 12 M., and 6 P.M.

About two weeks afterward the owner told me she had gotten so she could not stand in slings, had gotten down so she could not rise, and he had destroyed her.

A few days later he came to me with the information that another of his horses in the same stable was affected like the first one, and that he had turned this one out on the marsh to die. On questioning him, found he had been feeding millet cut green, and that the mare had had the same food.

I advised him to allow the horse to remain where he was, but to feed him sufficiently and not to allow him any millet. This he did, and on April 24th I saw him at the stable (a b. g., weight about 1300 pounds).

He was apparently all right, with the exception of some difficulty in rising. He is now working, and has been for over a week.

The stable was situated in the city, and the sanitation of it bad, the ceiling low, and the two horses were stabled along with about a dozen cows.

I regret that I did not have an opportunity to make an autopsy upon the mare; nevertheless am of the opinion that they were genuine cases of the millet disease, and that this disease and osteoporosis, although similar, are entirely distinct. I would be pleased to hear from you on the subject.

Yours very truly,

H. D. Paxson.

For the purpose of getting information from persons who had used millet for horses, we sent out on July 1, 1896, the following circular:

No. 1. Have you used millet for horses as a coarse food during the winter season?

No. 2. Were the horses confined in the stable or were they allowed to run out?

No. 3. About how much millet did you feed per feed?

No. 4. How many times a day?

No. 5. When did you last use millet as an exclusive coarse food?

No. 6. Do you believe that millet is one of the best foods for horses?

No. 7. If not, why not?

No. 8. Shall you continue to feed millet to your horses in winter?

No. 9. If any bad effects resulted from the feeding of millet, describe them in as few words as possible.

No. 10. Please answer and return as soon as you conveniently can.

Yours respectfully,

T. D. HINEBAUCH.

We sent out fifty circulars, but up to the present time have received returns but from four.

CIRCULAR NO. 1.

No. 1. Yes.

No. 2. They are allowed to run out.

No. 3. What a horse would eat in an hour.

No. 4. Once every day, and a part of the time twice.

No. 5. About June 1st.

No. 6. No.

No. 7. It appears to weaken their kidneys.

No. 8. No.

No. 9. On a horse which was fed on millet from October 1st until April 1st stiffness of the muscles, weakness of the back and kidneys, and falling away in flesh. This horse was put on grass on May 20th, and on July 1st he was as well as ever.

CIRCULAR NO. 2.

No. 1. I have.

No. 2. Allowed to run out.

No. 3. A small forkful for a pair of horses.

No. 4. Twice.

No. 5. Five years ago.

No. 6. I do not.

No. 7. It affects the kidneys too much. My horses on the plow made water nearly every mile.

No. 8. I shall not. Had rather feed straw.

No. 9. My horses were fat when commenced to use. Did not stand the work as they did before or since. Did not seem to have strength.

CIRCULAR NO. 3.

No. 1. Used Hungarian grass, and worked the horses on it.

No. 2. In stable nights, yard day-time.

No. 3. All they would eat.

No. 4. Once and twice.

No. 5. For the last four years. Am feeding it now.

No. 6. No better than good hay.

No. 8. Yes.

No. 9. I do not raise millet; I raise Hungarian. At our division we feed it wholly. Nothing else for coarse feed. Have fed it to mares heavy in foal all they would eat. Have not lost a horse in nearly two years. Have had no bad results from feeding it.

No. 4 (Letter).

I lost a mare this spring which I fed millet about two months last fall, then straw until April 1st. I then fed her millet (which was cut green) until June 1st, when she died.

Dr. Taylor, of Hillsboro, examined her, and found death had been caused by a rotting away of the bones in her right side. Eight of her ribs were broken, some in three or four places. Whether this was caused by millet or not he did not know.

She delivered a colt about a week before she was taken sick, which is alive and in a fine, healthy condition.

She was taken sick Wednesday and died on Sunday morning.

Respectfully,

ED. BURKE.

No. 5.

Instead of replying to the questions, I received the following communication from Charles Schwarz, Addison, N. D., August 12, 1896:

T. D. HINEBAUCH, V.S.

DEAR SIR: I will write you my experience in feeding millet hay, hoping that it will be more satisfactory than the answers to the questions. I have fed millet hay to horses more or less for the last ten years. I used to think that people did not know what they were speaking about when they said millet was injurious, but a year ago last April I had a mare with foal. I noticed she was lame on the left hind-leg, and was growing worse, until I had to get Dr. Walker, from Casselton. He thought it might be due to millet hay, so I quit feeding millet and put her in pasture. She improved right away until she was all right. After the colt was foaled I kept her in the barn and fed millet hay again, mostly to find out if she would get lame again. In about two weeks she was so lame on all four legs that she could hardly walk; but as it did not seem to hurt the other horses I kept on feeding it to them, until in the fall a good five-year-old horse also got lame, in a manner similar to the mare, in

the spring. I had to quit working him. It took longer for him to get over the lameness than it did the mare. He was lame all winter, but is all right now. Last winter I noticed as soon as a horse got affected by feeding millet he would look gaunt, as though he did not eat enough, and would then begin to fail in flesh.

I thought I noticed that it never seemed to hurt my colts, so after I found I had to quit feeding it to my work horses I thought I would keep on feeding the colts. I had a fine two-year-old that I fed millet to with the rest of the colts. He was fat and plump in the fall, but began losing flesh. Still I kept on feeding until he got lame like the other two. I stopped feeding the millet and fed straw and ground feed, but he was already so bad that he did not improve. He gradually grew worse, with swelling of the joints, and when I killed him the joint-water had puffed up all the joints so that they were hard and tense and broken through in some places and formed large bunches under the skin.

I also have a small Arabian pony that we had to lift up all winter from the effects of feeding millet, but he is now over it, and all my horses that have lived are all right now.

I will not feed millet hay to horses again.

Yours very truly,

CHARLES SCHWARZ.

I have been called in consultation with Dr. Taylor on some millet cases, and asked him to write up several of the cases as he saw them, and they are as follows:

Case No. 1. May 6, 1895, I was called to Mr. Erickson's farm to see a mare weighing about 1200 pounds, and also a two-year-old colt, both of them sick at the same time. I found the mare standing, holding upright front foot, appearing in great pain, trembling, fetlock-joints swollen and very tender to the touch. This mare had been fed on millet about two months, all she wanted to eat. She was heavy in foal. I treated her by giving soda salicylate three times a day in two-drachm doses, and had the leg bathed with hot water and bandaged. I was called again on the 8th, and found the mare lying on the left side, trying to foal. I removed the colt with little difficulty. The colt was in a natural position. After the colt was removed, the mare's ribs seemed to fall in. On examination I found seven ribs broken, some of them in two places. On turning her over I found six ribs broken on the other side, and in the right fetlock-joint the ligaments had given away, so you could turn the hoof up forward and touch the knee. On post-mortem I found the

ribs very soft and spongy. I could break them in my hand without difficulty. The ligaments of the joint had given away from the bone, leaving small fragments of bone attached to them. The two-year-old colt had to be lifted up on his feet. His joints were all swollen and very painful. He was destroyed a few days after I saw him. Did not hold post-mortem. Both horses were fed millet.

Case No. 2. May 30, 1896, I was called to Mr. Ed. Burke's farm, Blanchard, N. D., to see a gray mare, eight years old, weighing 1200 pounds. She was lying on her side, apparently in great pain. When assisted to her feet she would not stand nor put any weight on the right front leg. The fetlock-joint was swollen some and very tender to the touch; she was breathing hard. On examination found seven ribs broken, three of them in two places, and the ends of the ribs had penetrated the lungs. It being too late to hold post-mortem, I returned the next morning and found that the ribs were very easily broken, and the contents of the fetlock-joint was very dark colored, showing the presence of blood. The tissues were not ruptured in any way. This mare had been fed millet all winter and turned out into the yard every day until seven days before she was taken sick. At that time she foaled a healthy colt and remained in a box-stall for seven days, when she was turned out to pasture. She was noticed about an hour later walking very stiff, and shortly after was lying down, and had to be assisted to her feet. She was then removed to a large hay-shed with lots of bedding. The owner told me that she was very restless, lying down most of the time during the afternoon. I was called in the evening.

The same man had two other horses—one affected in the front feet, the other in the stifle and hind-foot. They recovered with the treatment of salicylate of soda when turned out to pasture.

I have never seen any of these cases except in horses that have been fed on millet, and am inclined to think that millet is an active agent in destroying the natural texture of the bone.

Case No. 3. May 11, 1896, I was called to Caledonia to James Patten's farm; found five cases of lameness, all of which had been fed on millet all winter, that being the only hay that Mr. Patten had. The disease did not show itself to any perceptible degree until he began to work them. During the first few days they gradually became affected—some in the joints of the front-legs, others in the joints of the hind-legs, and one all over apparently. She could be made to stand but a few moments at a time, and died after a week's illness. The balance of the horses recovered entirely.

An examination of the kidneys of No. 3 by Dr. Formad shows that there was chronic inflammation with a tendency to fatty degeneration.

We could go on and multiply cases almost indefinitely that have been due to the feeding of millet. The cases are all of a similar nature, and the lesions differ only, as it were, in location and severity. One animal may be attacked in the fore-extremities, another in the hind, and still another all over. There is one thing, though, that we have settled definitely, and that is with regard to the increased action of the kidneys. As long as the kidneys are active no bad results follow; when they cease to act then we have the beginning of the pathological lesions which have been described in a former paper. Quoting from this paper: "When we call to mind the physiological conditions that exist in azoturia and compare them with the conditions which exist in these cases, where the kidneys also fail to perform their functions, we find but little difference. In azoturia we have paralysis of the hind-extremities usually. In millet disease paralysis begins first at the hind-extremities and gradually extends until it includes the fore-extremity, and later to head and neck. We have seen cases of paralysis, due to the feeding of millet, where the horse was unable to move any portion of the body or its members. If the foot was placed in a certain position, it remained there until again moved artificially. The horse seemed to possess no power whatever of even moving a muscle."

In conclusion, I would like to call your attention to a comparison of Experiments I. and II., using grammes and averages. For detailed accounts of Experiment I. see *Proceedings of the Thirtieth Annual Meeting of the United States Veterinary Medical Association.*

TABLE I.—COMPARING EXPERIMENTS I. AND II., USING GRAMMES AND AVERAGES.[1]

Animal.		No. 1.	No. 2.	No. 3.	No. 4.	Nos. 1 & 2.	Nos. 3 & 4.
Urine	With hay,	8244.3	6377	3317.11	4611.48	7310.65	3964.3
	With millet,	14404.9	12258	7801.69	8097.71	13331.45	7699.7
Specific gravity	With hay,	1041.6	1046	1058	1050	1043.8	1054
	With millet,	1038.2	1037.3	1051	1043	1037.75	1047
Total solids	With hay,	726.18	610.9	323.76	393.7	668.04	358.73
	With millet,	1127.9	954.9	507.23	415.61	1041.4	461.42
Ash	With hay,	174.48	171.33	174.86	152.82	172.9	163.84
	With millet,	272.25	268.45	247.5	220.32	270.35	233.91
Nitrogen	With hay,	118.07	98.59	32.92	41.35	108.33	37.14
	With millet,	131.08	121.35	51.14	33.79	126.23	42.47

[1] Veterinary Magazine.

Table No. 2 shows the percentage relations of Experiment No. 1 and No. 2.

TABLE II.—SHOWING PERCENTAGE RELATIONS OF EXPERIMENTS I. AND II.

Animal.		Harry and Jim.	Nos. 3 and 4.	Nos. 3 and 4. Per cent. of Nos. 1 and 2.	Difference of Nos. 3 and 4 *vs.* Harry and Jim.
Urine	With hay,	7310.65	3964.3	54.22	3346.35
	With millet,	13331.45	7699.7	57.75	5631.75
Specific gravity	With hay,	1043.8	1054	100.98	0.0102
	With millet,	1037.75	1047	100.89	0.00925
Total solids	With hay,	668.54	358.73	53.65	309.81
	With millet,	1041.4	461.42	44.31	579.98
Ash	With hay,	172.9	163.84	94.76	9.06
	With millet,	270.35	233.91	86.52	36.44
Nitrogen	With hay,	108.33	37.14	34.35	71.19
	With millet,	126.22	42.72	33.65	83.75

Table No. 3 shows the average temperature during experiment.

TABLE III.—SHOWING AVERAGE TEMPERATURE DURING EXPERIMENT.

	No. 3.	No. 4.
Hay, first period	100.32°	100.23°
Millet, first period	100.48	100.27
Hay, second period	100.59	100.13
Millet, second period	100.76	99.98
Hay, both periods	100.46	100.18
Millet, both periods	100.62	100.13
Advantage of hay	+0.16	—0.05

VETERINARY DENTISTRY.

By L. A. MERILLAT, V.S.

The chief object of presenting a paper on this subject to this Association is to direct the attention of its members and the veterinary profession generally to a long-standing abuse—an abuse which stands before us to-day as one of the questions deserving the attention of this representative body of veterinarians—the practice of veterinary dentistry by persons not veterinary surgeons.

While it is quite impossible to ascertain the exact number of so-called veterinary dentists in the United States, I am able, through the assistance of a number of veterinarians, to locate two hundred and twenty plying their vocation east of the Mississippi. Of this number only those who practice this specialty exclusively as a means of livelihood are included, and only seven have college degrees. No mention is made of the many farriers and horsemen who never lose the opportunity to practise dentistry when permitted. In the large cities we find one veterinary dentist to every twenty veterinary surgeons. It must be remembered that prior to the panic of 1893, when horses were more valuable, this number was almost doubled; and with the return of prosperity to our profession their numbers will again reach alarming proportions.

In a large practice established for more than twenty years we find 56 per cent. of the gross income derived from the practice of medicine; 32 per cent. from operations on the locomotory apparatus; 8 per cent. from hospital practice; 4 per cent. from minor operations; 3 per cent. from miscellaneous operations; and 7 per cent. from dental surgery.

We speak of the great field of the veterinarian, yet our field of usefulness can ill afford a depredation of at least 5 per cent. by the intrusion of a specialist who has neither interest nor regard for the veterinary profession. It is not the veterinarian with a large practice, nor the occupant of a lucrative position, who is directly inter-

ested, as the sufferer is the young practitioner who is laboring faithfully for a small clientage.

With this condition, demonstrated by the above statistics growing upon us, we should endeavor to apply a remedy.

For the veterinary dentist who is duly qualified and who is a specialist from choice we must have every regard, yet it is doubtful if ours is a profession for specialties. But since this class of dentists are few, let us direct our attention to the majority.

The veterinary dentist learns his trade—I will say trade—by cohabitation. He is the product of his kind. He requires only two or three months' practice with a fellow dentist to qualify. He takes his place among his competitors with a set of highly polished instruments as a recommendation. He plies his vocation among the unsuspecting, and is addressed as "Doctor." With this new cognomen as a stimulus he soon finds an office in a livery, boarding, or sale stable, or a race-track. As he becomes more skilful his practice improves, and he is soon among us, a full-fledged veterinary dentist. His first notice to the public invariably contains a half-tone cut of the "professor" in action, together with literature lauding the great benefits derived from his particular operation, which is performed without the use of gag, speculum, or confinement of any nature. He lauds particularly his ability to domicile the most vicious animal, and undoubtedly firmly believes his operations will prevent, relieve, and cure a large number of habits and diseases which the veterinarian can often trace to entirely different sources.

Let us, however, not overlook the fact that he has justly won the good-graces of many a horseman by his skilful services, and that he is more skilful in the use of dental instruments than the average veterinarian. When we open our eyes to the fact that we are being out-classed, in the eyes of a critical public, by an empiric; when we become more devoted to our training in this branch of surgery; when we become more skilful with the use of dental instruments, we will witness the passing of the veterinary dentist, and not until then. As long as the veterinarian remains oblivious to this fact, so long will this specialist be among us.

True, in those States where veterinary associations have worked so unceasingly for favorable legislation and have obtained recognition by legislative bodies, the remedy is at hand by simply enforcing existing laws, which plainly cover this branch of surgery. But we must doubt the propriety of forcing our services upon the public

so long as the veterinary dentist demonstrates his superiority over us.

It is our experience in this case, as in many others, that his lack of scientific attainments receives no condemnation from the public, but, on the other hand, lack of dexterity on the part of the veterinarian who obtains the same results in his own way is duly condemned, and he (the veterinarian) is often branded as a "bungler." In our attempt to restrain the acquisitive desires of this specialist we must not forget that the horse-owning public is favorably impressed with his usefulness in many localities.

In the large cities, where horses are numerous, the practice of this specialty often proves a lucrative pursuit, and some dentists have attained a good-standing in their community; but since they would ignore the necessity of attending a regular veterinary college to qualify, we owe them no recognition, and to organize schools for veterinary dentistry could never meet the approval of the veterinary profession. When we make our claim that specialities of this kind have no place in our profession, the argument may be advanced that only a few years ago schools for the study of human dentistry were few, and the human dentist received his instructions from the practitioner much the same as the veterinary dentist does to-day. The course of study in these dental schools was short and unsatisfactory, dwelling particularly upon mechanical dentistry without regard for anatomy, physiology, or pathology, and that it is comparatively of late years that human dentistry occupied anything like a properly organized position among the different departments of minor surgery. For long it was practised to a large extent as a superadded means or livelihood by persons engaged in other pursuits, much the same as the farrier and "handy horseman" practises veterinary dentistry to-day. The watchmaker, the blacksmith, and often the barber was the village dentist, and even in large cities, practising under the very shadow of our universities and medical schools, was found this class of dentists. But to-day the practice of human dentistry has a place among the professions; their schools are a part of our universities, with a curriculum covering three long sessions, embracing the study of anatomy, physiology, pathology, bacteriology, and comparative anatomy.

That such a change can never come over the practice of veterinary dentistry is easily foretold. As veterinary dentistry is to-day, so will it always be. To remove ordinary irregularities, extract troublesome molars, and perhaps trephine the sinuses, is and always will be

the limit of the veterinary dentist's usefulness. And as the operation is one demanding muscular strength and manual dexterity more than anatomical or surgical knowledge, and often is performed as successfully by the irregular as by the regular practitioner, this speciality has no attraction for the well-to-do veterinarian. It is thus consigned to the uneducated and the charlatan, who do not fail to parade their specialty as sufficient to confer a surgical status upon them and entitle them to the designation "veterinary dentist" —a designation which is applied without discrimination or distinction to the unqualified as well as the qualified veterinary dentist.

The only change we may ever expect to note, and for which we should earnestly hope, is the practice of this branch of veterinary surgery by the regular qualified veterinarian, who, through improper training, disregard, and thoughtlessness, has consigned a useful and profitable branch of his profession to an empiric.

In this short discourse, which may be criticised as being rather "commercial," I have attempted to demonstrate the fact that the practice of veterinary dental surgery is too limited to be recognized as a specialty, yet of sufficient importance to deserve more attention from the veterinary practitioner.

In our sumptuous attempts to develop something new, let us not neglect the old.

This paper will be continued under the head of "Operative Dental Surgery." The literature on this subject is too voluminous to be presented at this meeting, but will be given to the veterinary journals for publication.

SOME POISONOUS STOCK FOODS.

By N. S. MAYO, V.S.

Recent investigation of diseases has emphasized the importance of toxic substances in their production. Most investigators have been at work in the wide and fascinating field which may be included under the ptomaïnes and leucomaïnes, and remarkable advances have been made. Yet there is another region which has furnished material for investigation and experiment for ages past; a field which will probably widen rapidly with the rapidly widening domain of organic chemistry. This field includes those toxic substances found either naturally, or, I may say, sometimes accidentally, in the phenogams or flowering plants. Toxic substances as found in plants may be either organic or inorganic. Organic poisons may be formed by the plant either in its anabolic or ketabolic changes. The inorganic poisons found in plants are substances taken from some surrounding medium, which may be stored, either temporarily or permanently, in the plant-tissue. Such substances must, of course, be soluble.

The organic poisons of plants have usually a highly complex chemical composition, with nitrogen forming the base, in the nature of an alkaloid; but toxic substances may occur as glucosides and also probably in other forms.

It seems probable also that toxic organic substances may occur in plants at certain stages in their growth, which are not ordinarily found and may not be natural to the plant—that is, in the metabolism of the plant combinations of chemical elements may occur which may be toxic, which later, as the chemical composition is changed, may be harmless or even beneficial when eaten by animals. This I may illustrate by some of the saccharine sorghums. Practical experience in the feeding of sorghum seems to demonstrate that in certain stages of its growth sorghum, especially second-growth sorghum, possesses very active toxic substances which earlier or later in the growth of the plant do not occur.

During the past two years I have been devoting some attention to what may be called an accidental poison which sometimes occurs in the cornplant. By an accidental poison I mean a substance which may be present normally in small amounts, but does not, except under favorable circumstances, occur in sufficient quantities to produce serious results when the plants are eaten by animals. Two years ago seven out of twelve head of cattle died during one night from the effects of potassium nitrate, which was contained in four armfuls of cornstalks. These cornstalks had been grown upon very rich soil, and a large amount of potassium nitrate—25 per cent. of the dry weight of the stalk in some instances—had been stored within or deposited upon the cornstalk. It was then thought that poisonous quantities of potassium nitrate would only be found in corn grown on soil that had been heavily manured; but since then I have found potash present in poisonous quantities in cornstalks grown without fertilizer upon bottom and upland soils.

The authorities on poisons, in giving the effects produced by potassium nitrate in poisonous doses upon human subjects, state that there is gastro-enteritis followed by paralysis. In cases where cattle have taken poisonous quantities I find the symptoms differ materially with the conditions under which the poison is taken. If the potassium nitrate is taken, well distributed through a large amount of food, death takes place by paralysis beginning at the posterior extremities, associated with a trembling of the voluntary muscles, with practically no symptoms of gastro-intestinal irritation. If the potash is taken with little food and considerable water, there is associated with the paralysis morbid gastro-intestinal irritation and diuresis. Less than eight ounces of potassium nitrate will produce fatal results in adult cattle if given upon an empty stomach.

Poisonous quantities of potassium nitrate in cornstalks often occur in patches in cornfields not recognized by any noticeable difference in the growth of the corn. The easiest way to detect the presence of the potash is by lighting a piece of the dry stalk with a match, the characteristic deflagration of the potash occurring. It can also be recognized by the taste, by chemical tests, and in some cases by the naked-eye appearance of fine crystals upon the cornstalk.

The presence of potash in poisonous quantities in the cornplant may be influenced by climatic conditions. In this State there is often a severe period of dry weather about the time corn is maturing. This may check the metabolic process in the plant and thus favor the deposition of potassium nitrate.

The presence of potassium nitrate in the cornstalks may possibly offer a solution to the well-known disease of cattle.

COTTONSEED MEAL.

Two years ago, owing to the failure of the corn crop in this State, a large amount of cottonseed meal was used for feeding cattle. It is the common practice to run hogs in the feed yards with fattening cattle, that the hogs may utilize the undigested and scattered food that would otherwise be wasted. For about the first thirty days hogs following cattle fed cottonseed meal would do nicely, gaining rapidly in flesh; then they were stricken with some peculiar malady which destroyed large numbers of them very suddenly, with practically no premonitory symptoms of death. The hogs would be found dead or dying. Autopsies revealed congestion of the lungs and small intestines and inflammation of the heart.

The Kansas Experiment Station, in some comparative feeding tests with pigs, found that those fed on a cottonseed-meal ration made remarkably fine gains for about the first five weeks, and then would die very suddenly, the autopsies revealing the pathological conditions previously mentioned. Bacteriological and microscopical examinations failed to give satisfactory results. In watching these experimental pigs as they were being weighed I noticed the pigs on the cottonseed-meal ration were easily distressed on being exercised, there seeming to be a weakness of the heart's action. A person could by close observation pick out the pig that would probably die next.

Cattle are not so seriously affected by the cottonseed meal. They make excellent gains for about three months, and then stock-feeders say they seem to be demented or partially blind, so that stockmen make it a rule not to feed cottonseed meal to fattening cattle over one hundred days.

The symptoms exhibited and pathological changes produced seemed to indicate the presence in the cottonseed meal of an alkaloidal substance. I began a chemical examination of the meal after Dragindorff's method, and soon found evidence of a nitrogenous base present in such quantities that one was at a loss to account for the comparatively mild results that followed the consumption. I found later that there are two alkaloidal bodies present in cottonseed meal. Cholin was discovered in 1881 by Professor R. Böhm in a cattle food prepared from cottonseed meal, which had proved poisonous to young cattle as a diet, and in 1882 Professor Rittenhausen and Dr. Weger discovered another nitrogenous base—betaine. Betaine is considered by most authors to be innocuous.

Professor Wiley informs me that Mr. Maxwell, in his investigation of cottonseed meal, found nearly five times as much betaine as cholin. Dr. Wiley thinks that the betaine is formed first, and that cholin is an oxidized product. The presence of two alkaloids, one innocuous, present in considerable quantities, the other toxic, but present in small quantities, accounts for the abundant reaction in testing for alkaloids and the comparatively long time required in feeding cottonseed meal to produce serious results.

There are indications, however, that these two nitrogenous bases are not the only injurious substances which may be present in cottonseed meal, and a further study of this food may give important results.

About April 28, 1896, two outbreaks of poisoning of cattle occurred, five dying at one place and six at the other. All the animals died within thirty-six hours from the effect of some powerful depressant. They were literally "tired to death." In both outbreaks the cattle were fed hay and grain at a corral, but had access to fields where vegetation was starting. There were two plants to which the poison could be attributed—the "cocklebur" (xanthium canadense) and the "cowbane" or (cicuta maculata).

The "cocklebur," a very common noxious weed, is occasionally reported by farmers to be poisonous to hogs, and in the last report of the Bureau of Animal Industry another species is reported to be poisonous to stock in Australia. So far, however, tests and experiments made by Professor Failyer, chemist at the Kansas Experiment Station, and myself have given negative results. While these experiments are not conclusive, I am inclined to the opinion that the "cocklebur," because so common and obnoxious, is made the scapegoat for other less common but more toxic plants.

In both of these outbreaks of poisoning the cattle died evidently from eating the young tops of the "wild parsnips" (cicuta maculata). The poisonous principle of this plant is known as cicutoxin, a powerful depressant, very similar in the physiological action to conium or hemlock, to which plant it is quite closely related botanically.

Experiments are being made to determine more of the toxic nature of this plant and of others which are popularly reported to be more or less poisonous to animals, among which may be mentioned the buckeye (æsculus glabra), the "jimson" weed (datura stramonium), and "loco" weeds, but the results are not yet sufficient to warrant conclusions.

TOE-CLIP INJURIES.

By JAMES A. WAUGH, V.S.

These are due mainly to accidental errors in farriery, and are caused generally by excessive paring or cutting away of the antero-inferior part of the sole and cutting a nick in the toe of the hoof-wall for the reception of the toe-clip, which is occasionally hammered into position firmly by a large hammer while the foot is resting on the ground surface or shop floor. It occurs in one or both front-feet, and occasionally one or both hind-feet are affected, but it is most common in fore-feet. I have seen it resulting from small, medium, and large toe-clips. This peculiar form of injury generally causes considerable uneasiness and altered action in the affected foot or feet within a few days or a week after shoeing, and if neglected or overlooked for several days may result in extensive inflammation, exudation, and suppuration, followed by unfavorable results or even death. Horses and mules are alike sufferers, but the former are less able to withstand the pain and annoyance of it. Mules usually make a favorable but slow recovery. The most prominent symptoms are apparent uneasiness and pain in the affected foot or feet, and altered or modified action in motion, or changed position at rest. The condition and appearance of shoes will assist in confirming the diagnosis. The advanced or well-marked symptoms are incidental with the above-mentioned, but in an aggravated form, and where only one fore-foot is affected there will be a well-marked disinclination to bring the foot and limb backward, and the lameness and suffering will appear greatest or severest when the foot is brought back to a level or line with its mate and bearing equal weight. When at rest the foot is elevated at the heel and rests lightly on the toe, while the scapulo-humeral angle is reduced, the elbow much lowered, the knee bowed forward, with back tendons tense and prominent, and the limb apparently lengthened wonderfully. When both fore-feet are affected the patient stands with the feet well set apart and shifts the weight

frequently from one foot to the other and rests the limb in a modified form, as above described. The hind-feet are occasionally affected, and are advanced well under the body in early stages if both feet are involved in the injury; but if only one foot is affected, then it is usually elevated and rested off the ground or floor surface. The fore- seem more prone to this injury than the hind-feet. Loose and ill-fitting shoes occasionally slip backward, and the toe-clip works inside the hoof-wall at the union at the anterior part of the sole, and may cause serious injury, especially in aged horses at hard work in cities. I have seen a few cases where the farrier put on short shoes rapidly without fitting, and the toe-clip was allowed to penetrate the part just described, but lameness soon resulted, and we discovered the cause and removed it in due time. It appears that these accidents are most common among company horses and mules shod by incompetent men who have never served a regular apprenticeship to the trade; in fact, never learned it—just picked it up in a half-hearted manner or self-learned style.

Treatment should be based on modern surgical principles. Remove the exciting cause and apply cold or hot baths or medicated poultices to the feet, and, if deemed necessary, put the patient in slings or trevit. It is sometimes necessary to make an opening at the anterior border of the sole and postero-inferior border of the toe to allow the escape and drainage of serous exudation or pus. The treatment will be a minor affair when one acquires sufficient knowledge and clinical experience enough to diagnosticate a case. It appears there is a dearth of literature on this subject in our veterinary text-books in this country, and I asked for a little information about it from a veterinarian who had been a horseshoer for twenty-five years, also a student at two veterinary colleges, also graduate of one, and he candidly admitted that he had never seen a case or even heard of a case of toe-clip injury, and his father had been a horse-doctor and horseshoer for over sixty years. Therefore, I deem it advisable to present brief reports of several cases from my own private practice.

No. 1. Clyde mare, owned by a capitalist and located on a farm eighteen miles from the city. She was shod and put to work early in the springtime, and, because very lame in the right fore-foot, a city veterinarian was summoned, but was too busy to attend, yet he promised to send the writer, but was dilatory and busy, and overlooked it. Then another one was called, but he, too, was too busy for a country trip, but promised to send a better man. They both

called me about the same time, and I hastened out and found the patient suffering severely and unable to eat any food. The foot was very hot and painful, tendons and ligaments tense at the back of the knee; knee bowed forward; elbow lowered; scapulo-humeral angle reduced, and limb apparently much elongated, with the heel elevated and the foot resting lightly on the toe. The blacksmith was a very careful young man, and had removed the shoe and searched every nail-hole for pricks or binds, but without avail, and the foot was poulticed. It was a very fine animal and had excellent feet. The foot-searcher indicated soreness at the union of the sole with the toe, and we pared away until a dark, serous fluid escaped freely from the injured parts; then we injected it with a creolin lotion and dressed with poultice and sack; gave cannabis indica and belladonna internally to relieve the suffering and soothe the patient. Applied hot fomentations and poultices; also creolin lotion, injected freely into the wound. I revisited the case in a few days and found the limb greatly swollen, appetite very meagre, and the temperature 102° F. Hot fomentations were applied freely and frequently to the limb and foot, but treatment proved of no avail, and the patient died in a few days, presumably from septicæmia or pyæmia. I observed that this animal had a very fine, thin skin, with corresponding thin-shelled hoofs and soles, and the blacksmith had used very large toe-clips on account of fearing the shoes would be easily pulled off while working on limestone soil and muddy roads. This case set me to thinking, studying, and working to learn more by careful observation.

Case No. 2. A fine roadster was hired by an oil producer to drive eighteen miles over plank road into an oil field. The horse was so lame the next day on the return trip that it became necessary to leave him at a road-house five miles from the city, and the driver came in and reported the bad condition of the horse. The owner directed me to examine carefully, and, if the horse was permanently disabled with the injury, he would then prosecute under the Livery Act. I found a new set of the much-lauded Good-Enough shoes on the front-feet, and the left fore-feet affected as decribed in this article. I used the whip freely and drove one mile to a blacksmith shop, removed the shoe, and dark serum flowed out, as mentioned, even without cutting, and we enlarged the opening, injected creolin lotion, and plugged the opening with a tent of marine lint; shod with a slipper, drove into the city, then applied the treatment indi-

cated in this article. Result, recovery after twenty-one days' treatment and loss of services.

Case No. 3. A large, heavy draft mule had been newly shod by a strange blacksmith; shoes were removed on account of lameness, and then reapplied by the same man. Owner finally called me in to see the patient after another doctor had been unable to determine what was wrong. The owner even asserted uncharitably that the other man was unable to regain a condition of sobriety or good sight. However, I found pus oozing out at the anterior middle part of the coronary bands and the heels of both fore-feet, great uneasiness, much suffering, and loss of appetite, and the owner expected fatal results in this case, and was angry. Treatment was the same as recommended in this article. Result, recovery after two months' treatment and four months' illness and loss of service, etc.

Case No. 4. Gray gelding, used in an express wagon; patient lame in the left fore-foot or limb, but the blacksmith claimed it was in the shoulder, while others said elsewhere. Owner said a doctor must settle the dispute and save all useless experiments on his property. It was late in the evening and dark, so I decided to withhold my opinion and diagnosis until we could meet at the horseshoer's shop at eight A.M. the next day; but I happened to be out late that evening, and did not get around on time, but the blacksmith removed the shoe, trimmed the sole, and found exudation and pus due to toe-clip injury, and had the case nicely demonstrated on my arrival. Treatment same as outlined in this article, except leather sole was used between foot and shoe for a few weeks after resuming work.

I could cite several other interesting cases, but these will illustrate my remarks and perhaps induce others to make observations and report their cases for professional advancement.

DAIRY INSPECTION.

By FRED. BRAGINTON, V.S.

Mr. Chairman and Gentlemen: The sanitary conditions of dairies, the importance of which is not perhaps fully appreciated by the profession and scarcely at all considered by the public-at-large, seems to me should demand such a thorough inspection that its products should be wholesome and free from contamination with pathognomonic germs.

And how is it to be prevented and the herd kept in health? is the question which presents itself for our consideration.

How often have we in a professional capacity visited dairies during the winter months, and on entering the barns where the cows were confined been nearly stifled by the odors emanating therefrom.

To economize room, the ceilings were sometimes not over six feet in height and a cow to every three feet in width. Allowing for gangways, etc., giving for each cow 180 cubic feet, how long would it take an ordinary sized cow to exhaust 180 cubic feet if no fresh air were introduced from without? The amount of tidal air used in each inspiration may be taken at 240 cubic inches. Twelve respirations being the average per minute, it would take about three hours and a half. Pure air, when completely dried, consists in 100 parts by volume of 20.8 oxygen and 79.2 nitrogen. One hundred volumes of expired air, when dried, leaves 98 volumes, which consists of oxygen 15.4, nitrogen 79.2, carbon dioxide 4.2. In twenty-four hours 1230 cubic feet are breathed and loses 5.4 per cent. of the oxygen. The total quantity of this gas taken up by the lungs in twenty-four hours is 66.4 cubic feet. The amount of carbon dioxide excreted from the lungs being 4.3 per cent. of the volume of air breathed, in twenty-four hours 42.8 cubic feet of carbon dioxide would be exhaled.

It is not so much on account of lack of oxygen in the air that the animals suffer as it is because of the poisoning of the air by contamination with the expired air, which contains other noxious elements than carbon dioxide and far more injurious.

A low estimate of the space required to have the air fairly pure would be 800 cubic feet of space to each animal, and a renewal of 1 cubic feet per minute. Fortunately, many dairymen allow even more than this. Fortunately for themselves as well as for their patrons, these would need very little inspection, but the former is where an ounce of prevention would be worth pounds of cure. For hygiene and sanitary surroundings would be the greatest preventives of the spread of tuberculosis—one of the most dreaded diseases to which the human race is subject.

Tuberculosis may affect any part of the body, and is quite as often found affecting the mammary gland as other parts of the body.

The mammary gland is not a storehouse, but an elaborator, and when the gland becomes infected with any disease it is for that reason far more liable to contaminate the milk than if situated in a more remote part; for this reason particular attention should be paid to the udder.

However, if tuberculosis is present in any part of the body, the bacillus is liable at any time to be carried by the circulation to the udder, and therefore it is at all times a source of danger.

The bacilli of tuberculosis are so constantly present that it is almost impossible for man or beast to escape their inhalation at times. And the only reason why everyone does not become infected is because the tissues in health naturally resist the invasion of the tubercle bacilli, and it is only when the system is vitiated that it becomes a nidus for its multiplication.

Stanchions, which are used by so many, prevent the animal breathing in a natural manner. By compelling the animal to lie always in the same position some parts of the lungs are never naturally expanded with air, and consequently the cells are weakened, and on the inhalation of the bacilli it becomes a focus for its growth or its entrance in the general circulation, and gains a foothold in some other part of the system; where, if the lungs had been naturally expanded with fresh air, the chances would have been for the destruction of the bacilli.

Sunlight and pure air are nature's own bactericide, and are provided by nature with a lavish hand; and why withhold that, the lack of which will allow so many pathognomonic germs to thrive? Some cows are continuously confined within the barn, never being allowed in the sunlight, where, if the owner's attention was properly directed to the value of sunlight in the way of prevention and in many cases the cure of disease, they would do differently. As a

rule, dairymen are anxious to have their herds in the best of health. In fact, at their own expense some have had their cows tested with tuberculin.

The cattle on the plains rarely if ever suffer from tuberculosis, and it is doubtful if it were introduced in a herd so situated that it would spread. And why is this so? The inference is that the sunlight, together with the natural mode of living, does not permit the bacilli to multiply. In thickly inhabitated countries these conditions cannot be fully met. The health and happiness of a people depend largely upon its food-supply, and while no single food will supply the entire needs of nature when the constituents of milk are considered, it will be seen that it comes nearest to a perfect food, and in the early life of all mammalia it is the only food suitable to existence.

Most all other foods are not used in the raw state, and for that reason would not require so thorough an insvection, as a temperature at or near the boiling-point is in most cases destructive to pathognomic germs.

Milk being the principal food during infantile life, and which oftentimes must be supplied by the cow, this is the time at which the system is most susceptible to the influence of deleterious foods, and is the time at which the tissues offer the least resistance to the bacilli of tuberculosis as well as to all other germs of disease.

It has been abundantly proven by experimenting with animals by feeding milk containing the bacilli of tuberculosis that it can be readily produced this way. And while adult life has a natural resistance to disease, it is never safe to tempt nature and Providence by taking into the system an unwholesome food. And the only safe procedure is to have the dairies inspected at least once every six months and every cow tested with tuberculin.

It might be said, Why not eradicate tuberculosis at once by destroying all animals affected and thereby lessen the expense of inspection? If tuberculosis were only found in the bovine, that would be the logical procedure; but when it is remembered that all domestic animals are quite susceptible to its attacks, with the possible exception of the horse, and that about one person in every eight is affected in some manner with tuberculosis, it is evident that it can never be entirely eradicated; and all inspection could do or expect to accomplish would be to prevent its transmission from the bovine to the human. The attendants, if affected with tuberculosis, in many cases do not understand the contagious char-

acter of the sputa, and consequently expectorate promiscuously, and thus the provender becomes contaminated; or, again, it may become dried and infect the air, and in this way enter the respiratory tract.

As before mentioned, each cow should ordinarily be allowed 800 cubic feet of space, with a separate stall for each cow and a pure water-supply that the cows may have access to at all times, and the barn scrubbed out as occasion demands, and the excrements removed at a safe distance from the barn.

Some barns are so arranged that the excrements during the entire winter are allowed to be stored in a basement immediately beneath the cows. Where this occurs it is impossible to keep the air free from contamination with escaping ammonia and other noxious gases and odors.

All bedding used for dairy cows should be free from mould and in a clean condition, for many bacteria enter the gland from without by way of the milk-duct and again at milking pass away with the lacteal secretion, where they rapidly multiply and increase in virulence. When milk so contaminated is shipped to the city and retailed, it is but to spread the germs of disease.

Parenchymatous mammitis will cause to be produced large numbers of micrococcus, which, when taken into the alimentary canal, will produce acute intestinal catarrh.

Outbreaks of typhoid fever, scarlet fever, and diphtheria have been traced to a contaminated milk-supply, and in some instances the milk becomes so contaminated by using impure water to cleanse the milking utensils. All seams about tin-pails, etc., should be well soldered and cleansed each time before using with scalding water.

Anyone, by observing the contents of the bottom of a milk-can that has contained milk as ordinarily found on the market will be convinced that cleanliness has not been properly observed.

Cows should not be allowed to stand in stagnant water nor to drink anything but pure water. Where they are allowed to drink stagnant water there is sometimes a morbid condition of the digestive apparatus produced, and they will then drink stagnant water even if they have access to fresh water.

A wholesome milk cannot be elaborated from an unwholesome diet, nor can it be produced by cows that are worried by dogs or kept in constant fear by ill-tempered attendants. What evidence have we that this is a fact!

There is an analogy between all animals, and it is frequently

observed in the human subject that nursing the child immediately after a violent fright or fit of anger the infant will become affected with spasms, and in some cases death follows.

Where the cows have been standing in muddy water and their udders become covered with dirt, unless they are thoroughly washed before milking the dirt will of a necessity during milking be brushed by the hands and arms of the milker into the milk.

The udder should be thoroughly cleansed before milking, and at each milking the milker should have at least clean outer garments.

For practical inspection the Federal Government should employ competent veterinarians who are graduates of reputable veterinary colleges.

The people should demand this, for it would be a benefit to both dairymen and consumer—a benefit to the dairymen by creating a better demand for their products.

When a consumer could be reasonably satisfied that the milk which he orders at a hotel or restaurant or buys as peddled out that he is not getting the products of cows affected with actinomycosis, tuberculosis, or any other disease of a contagious nature, he would at once become a large consumer.

There is no need to exaggerate the facts or to ignore the fact of dangers as expressed for fear of creating alarm.

True, most dairymen are too conscientious to sell milk from any cows which they know to be in any way diseased. But some do not realize the dangers of contaminated milk, and others do not care. It is for these that inspection should be so thoroughly performed that the consumer would be absolutely sure of obtaining a wholesome milk-supply.

Primarily, the medical man's duty is to discover the causation of disease, and when possible to remove or render the cause inoperative.

Those diseases which are caused by unwholesome milk and meat need the co-operation of the veterinarian and physician to effect their suppression, as they certainly do to point out their origin.

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